

Message

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**From:** Suraj Nagaraj [snagaraj@tesla.com]  
**Sent:** 6/11/2020 5:31:12 PM  
**To:** Wright, DavidA [Wright.DavidA@epa.gov]; Vineet Mehta [vineet@tesla.com]; Rohan Patel [rohpatel@tesla.com]; Ray Wang [raywang@tesla.com]  
**CC:** Cullen, Daniel [Cullen.Daniel@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]; Rojeck, Tristin [rojeck.tristin@epa.gov]; Snyder, Jim [Snyder.Jim@epa.gov]; Bunker, Byron [bunker.byron@epa.gov]  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Hi David,

**Ex. 4 CBI**

Hope this clarifies our motivation to use a more representative pack for the most recent test. Happy to discuss further.

**Ex. 4 CBI**

Suraj

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**From:** Suraj Nagaraj  
**Sent:** Thursday, June 11, 2020 9:53 AM  
**To:** 'Wright, DavidA' <Wright.DavidA@epa.gov>; Vineet Mehta <vineet@tesla.com>; Rohan Patel <rohpatel@tesla.com>; Ray Wang <raywang@tesla.com>  
**Cc:** Cullen, Daniel <Cullen.Daniel@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>; Bunker, Byron <bunker.byron@epa.gov>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Hi David,

It's good to hear that EPA will accept our methodology on the RL calculation. We will continue to use that for all future tests on SX.

# Ex. 4 CBI

Can we get on a quick call today to discuss this ? We will try and work around your schedule. We are very close to closing this out and I'd like to keep the momentum going.

Suraj

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**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Sent:** Thursday, June 11, 2020 9:13 AM

**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

Having reviewed the calculations and data provided by Tesla for estimating the vehicle road load force when the vehicle is operating at standard ride height, EPA accepts the calculation methodology and the road load force blending methodology described by Tesla.

EPA staff have also discussed and reviewed the materials Tesla has provided to date describing the rationale used to swap the battery pack without seeking Administrator approval prior to re-testing the MS LR+ running change configuration. Based on the material Tesla has provided to date it appears that the mean cell capacity of the pack installed in the MS LR+ for testing on June 8<sup>th</sup> is above the average capacity of all production tested lots for the time period shown. The prior battery pack which Tesla removed from the MS LR+ FEDV FEDV appears to be more representative of the mean cell capacity based on the data Tesla has provided EPA. As such it appears to EPA, unless Tesla has additional compelling data they can share with EPA, that the prior battery pack is the pack which should be used for fuel economy label testing.

Let me know if you have any additional questions, or additional materials you would like to share with the Agency.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

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**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Wednesday, June 10, 2020 6:56 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

David,  
Thank you for the quick feedback. Please see my responses below. All test datasets and Decision information datasets are now available for your review on EV-CIS. If we have satisfactorily answered all your questions, could I ask for an approval (provisional or otherwise) by tomorrow morning ?

Suraj

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**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Sent:** Wednesday, June 10, 2020 2:45 PM  
**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

EPA staff have discussed the road load force analysis provided by Tesla and I expect we will have our response to your proposed blended road load force curve before close of business tomorrow. At this time we do not have any additional questions for Tesla regarding the road load force curve.

In our prior discussions with Tesla, Tesla staff have indicated that the vehicles and battery packs used for fuel economy testing were random selections from the production or pre-production build process and as such met EPA regulatory requirements. §86.1830(a)(2) states components affecting emissions which are used to build test vehicles shall either be randomly selected from production parts or parts verified to be in the middle 50 percent of the tolerance range. The manufacturer will determine which components affect emissions (or range and consumption for EVs) using good engineering judgment.

**Ex. 4 CBI**

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467



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**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Sent:** Wednesday, June 10, 2020 12:55 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

**\*Confidential\***

David,

**Ex. 4 CBI**

Suraj

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**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Sent:** Wednesday, June 10, 2020 7:28 AM

**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

Our internal team will get together to review and discuss the materials you have provided regarding the model-based blended RL curve, once we have completed our review I expect that we will respond to Tesla with any comments or questions the Agency might have.

EPA does have some questions based on the information you have provided in your e-mail. As I read your e-mail Tesla has replaced the battery pack in your existing Model S LR+ fuel economy data vehicle (FEDV). EPA's fuel economy and greenhouse gas regulations found in 40 CFR Part 600 outline the acceptability of vehicles used for fuel economy label testing. §600.07, Vehicle acceptability, defines the requirements for a vehicle to be acceptable for fuel economy testing. As I review this section it appears to me that the provisions of §600.07(b)(1) apply to the existing Model S LR+ FEDV. As noted in the last two sentences of that paragraph, *"The components installed for a fuel economy test are not required to be the ones with which the mileage was accumulated, e.g., axles, transmission types, and tire sizes may be changed. The Administrator will determine if vehicle/engine component changes are acceptable."*

Based on EPA's regulations it was the Agency's expectation that the blended road load curve would have been developed by Tesla, reviewed with EPA, and then the existing Model S LR+ FEDV would be tested using the new blended curve.

According to our reading of the regulations prior to swapping the battery pack Tesla needed to inform the Administrator of this plan and seek our approval prior to proceeding. As such, in addition, to reviewing the road load force curve EPA now needs to determine if the battery swap Tesla has performed is acceptable. Tesla had previously concluded that the pre-production [Ex. 4 CBI] cells were representative of the production intent cells and were sufficient to generate representative fuel economy data. Does Tesla have any additional information they wish to share with the Agency regarding the decision to swap the battery pack, beyond the information provided in this e-mail?

The EPA team will meet later today and I expect that we will get back in touch with you prior to the close of business today regarding our review of the blended road load force curve and our timing for decision-making.

Let me know if you have any questions or need any additional information.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

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**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Wednesday, June 10, 2020 1:08 AM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Hi David,

My apologies for the delayed response. Per EPA's direction, we reran the MCT full discharge test using a model based blended RL curve to account for standard ride height below 50mph. The attached slides outline the methodology used to determine blending strategy. As we get ready to start production, the [ ] cell pack has reached a representative level of maturity. Hence, for the MCT, we sourced a new more production representative pack (the older test was run on a pack with an early batch of pre-production [Ex. 4 CBI] cells from the supplier) but used the same vehicle. All other aspects of the test and vehicle remain identical to the previous submission. The MCT tests have completed today and the test team is running some final checks on the data. We should have them ready for submission by mid-day tomorrow. Along with the datasets, we will also send you a couple of slides outlining the detailed test results and evolution of cell energy distribution (directly from the supplier) as we near start of production. We really want to bring this home this week as production has been stalled for more than a week now. We sincerely request EPA to expedite the review of the submitted datasets and give us the approval (provisional or otherwise) before COB Thursday.

Suraj

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**From:** Wright, DavidA <Wright.DavidA@epa.gov>

**Sent:** Wednesday, June 3, 2020 2:36 PM

**To:** Vineet Mehta <vineet@tesla.com>; Rohan Patel <rohpatel@tesla.com>; Suraj Nagaraj <snagaraj@tesla.com>; Ray Wang <raywang@tesla.com>

**Cc:** Cullen, Daniel <Cullen.Daniel@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>; Bunker, Byron <bunker.byron@epa.gov>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

Tesla Team,

We have reviewed Tesla's request to use the 'low' ride height to determine road load forces for the UDDS cycle and analytically adjust the test result. At this time EPA believes that is not appropriate based on the vehicle never operating at low ride height in urban driving at the speeds observed on the UDDS. Also, after reviewing the Model S ride height distribution as a function of vehicle speed it is apparent to EPA that the appropriate approach for generating a road load force curve which is representative of vehicle operation is to use the 'standard' ride height road load force from 0 to 50 mph and the 'low' ride height road load force at speeds of 65 mph and above. The force curves between the 'standard' and 'low' ride height values are then blended between 50 and 65 mph. EPA has had discussions with numerous manufacturers over the years regarding their active aerodynamic features and the approach that is proposed here is the same approach EPA uses for all of industry on vehicles with active aerodynamic features.

EPA requires manufacturers supply representative road-load force data for their vehicles which is used when performing emissions and fuel economy testing. As noted in EPA guidance letter CD-15-04 Determination and Use of Vehicle Road-Load Force and Dynamometer Settings D.4. – For active devices (which are not driver controlled) which may behave differently during the coastdown test than during the emission test cycles or normal drive conditions, manufacturers shall seek EPA approval under CFR 86.1840 for determining the settings for coastdown testing and road-load force specification. Examples of these active devices are active grill shutters, active suspension height, and active aerodynamic features.

At this time EPA requests Tesla perform an MCT test on the running change Model S Long Range Plus using the blended road load force curve described in the first paragraph of this e-mail. The results from this new MCT will be used for determining the 2-cycle energy consumption and range for the Model S Long Range Plus running change.

Please let me know if you have any questions regarding our position and request to generate a blended road load force curve based on the 'standard' and 'low' ride height settings for this vehicle. Also, do not hesitate to contact us if you have any questions about the guidance letter.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

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**From:** Vineet Mehta <vineet@tesla.com>

**Sent:** Monday, June 01, 2020 9:30 PM

**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>; Wehrly, Linc

<wehrly.linc@epa.gov>

Cc: Suraj Nagaraj <snagaraj@tesla.com>; Ray Wang <raywang@tesla.com>; Rohan Patel <rohpatel@tesla.com>

**Subject:** Slides for Vehicle Efficiency Calculations

David, et al,

Here are the slides we reviewed earlier. This detailed analysis highlights a few points

1. An overview of losses that are captured in the Road load curve and exact definition of vehicle efficiency
2. Single point efficiency measurement as illustrated by the EPA spreadsheet is not representative as the value changes during the course of the test as the vehicle and powertrain heats up more than it did during the 2-HWFET cycle warmup before the derivations
3. Aggregate efficiency values over UDDS and HWFET cycles for Tesla vehicles fall between 80-90% range, and within our expectations
4. Based on our analysis, a couple of competitor vehicles seem to exhibit vehicle efficiency values at or above 100%

On the topic of ride height adjustment, the difference in aero drag coefficient between standard and low ride height is Ex. 4 CBI

**Ex. 4 CBI** This difference results in 0.35 miles and is likely to be within the test to test variability of the MCT. Even if we use a model adjusted set of coefficients, the test results will fall within the repeatability of the dyno test.

Moreover, we mined our fleet data for distance driven at each of the ride height settings. Percent distribution for the Model S fleet turns out to be...

- Low Ex. 4 CBI
- Standard: Ex. 4 CBI
- High Ex. 4 CBI
- VeryHigh Ex. 4 CBI
- VeryLow Ex. 4 CBI

**Ex. 4 CBI**

Let us know if you have any further questions on either of these 2 topics. Looking forward to hearing from you tomorrow.

Vineet, Suraj, and Rohan.

Message

**From:** Suraj Nagaraj [snagaraj@tesla.com]  
**Sent:** 7/20/2020 6:27:34 PM  
**To:** Bunker, Byron [bunker.byron@epa.gov]; Rojeck, Tristin [rojeck.tristin@epa.gov]  
**CC:** Cullen, Daniel [Cullen.Daniel@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]; Snyder, Jim [Snyder.Jim@epa.gov]; Wright, DavidA [Wright.DavidA@epa.gov]; Vineet Mehta [vineet@tesla.com]; Rohan Patel [rohpatel@tesla.com]; Ray Wang [raywang@tesla.com]  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Dear Byron,

# Ex. 4 CBI

## Ex. 4 CBI

While the CAA certainly permits the EPA to require a manufacturer to provide information to determine compliance, to our understanding, the EPA has never needed this data from any other automaker to do the same, and we are concerned that the EPA is singling Tesla out. We hope the EPA will treat us consistent with other automakers.

Kind Regards  
Suraj

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**From:** Bunker, Byron <bunker.byron@epa.gov>  
**Sent:** Wednesday, July 15, 2020 10:19 AM  
**To:** Suraj Nagaraj <snagaraj@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Cullen, Daniel <Cullen.Daniel@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>; Wright, DavidA <Wright.DavidA@epa.gov>; Vineet Mehta <vineet@tesla.com>; Rohan Patel <rohpatel@tesla.com>; Ray Wang <raywang@tesla.com>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Dear Suraj,

I am disappointed to be sending this note to you based on your e-mail below and my understanding of the dialogue that has been had with our EPA team. This is not how we expect a manufacturer to work with EPA in ensuring your compliance with our regulations. Failure by Tesla to live up to commitments made to the Agency fundamentally undermines the confidence our team has in the assertions Tesla makes to us and will inevitably make it more difficult for EPA to quickly review and approve future applications supported by what will have become mere assertions by Tesla.

# Ex. 4 CBI

certificate (e.g., if you produce vehicles whose nominal cell capacity are materially different from what you have asserted to us), we may conclude that the products Tesla has produced are not covered by the certificate at all. Introducing vehicles into commerce not covered by a valid Certificate of Conformity is a violation of CAA Section 203(a)(1) and is subject to civil penalties that are in excess of \$40,000 per vehicle.

We understand that Tesla and its employees put a lot of pressure on themselves to continually push the envelope of engineering design and manufacturing progress. In many ways, the company is to be lauded for that. However, that is no excuse for the company to fail to follow through on commitments it makes to EPA or to cut corners in how the company meets its various obligations under the Clean Air Act. Tesla needs to make sure it is delivering the best products it can for its customers in part by scrupulously following through in its obligations to EPA. If we find that Tesla is failing to meet its requirements, we are prepared to take appropriate actions including to deny future certification applications where a demonstration has not been made, to suspend or revoke certificates where Tesla is not meeting the terms of the certificate, and to seek civil enforcement where Tesla has violated the Clean Air Act.

## Ex. 4 CBI

Byron

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Byron Bunker  
Director Compliance Division  
Office of Transportation and Air Quality  
Environmental Protection Agency  
2000 Traverwood Drive  
Ann Arbor, MI 48105  
[Bunker.Byron@epa.gov](mailto:Bunker.Byron@epa.gov)  
Phone: (734) 214-4155  
Mobile: (734) 353-9623

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**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Sent:** Wednesday, July 01, 2020 1:47 PM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>;

Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta

<[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

Hi David & Tristin.

## Ex. 4 CBI

of July.

Please let me know if need additional context.

Suraj

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**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Sent:** Monday, June 15, 2020 7:08 PM  
**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Hello Suraj,

Thank you for reaching out and agreeing to fulfill the requests outlined by EPA. The waiver for the confirmatory test decision information has been processed in EV-CIS. At this time, contingent on the conditions outlined in this email conversation, EPA accepts the attached Fuel Economy Label for the Tesla Model S Long Range Plus.

EPA will include the MY20 MS LR+ on [FuelEconomy.gov](http://FuelEconomy.gov) with the next scheduled update on 6/23.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

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**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Monday, June 15, 2020 3:48 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

David,

Tesla concurs on all three requests. We are going to send EPA the detailed methodology used to determine

Ex. 4 CBI

Ex. 4 CBI

Suraj

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**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Sent:** Monday, June 15, 2020 11:01 AM  
**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

# Ex. 4 CBI

EPA regulations require vehicles used for demonstrating fuel economy labels be representative of the vehicles the manufacturer will be producing. This requirement is outlined in §86.1830(a)(2) as previously described in this e-mail chain and additional language can be found in §600.008(a)(2)(i) “... In the case of electric vehicles, the manufacturer should describe the steps taken to ensure that the vehicle with respect to its electric traction motor, motor controller, battery configuration, or any other device or component, as applicable will be representative of production vehicles.”

§86.1844-01(g) states “The manufacturer shall provide the following information, or other information as deemed necessary by the Administrator, to the Agency upon written request by the Administrator. This includes any information, or explanations of such information as specified in paragraphs (d), (e), and (f) of this section. Paragraph (d) of §86.1844-01 refers to the Part 1 Application and items required as part of the Part 1 application. Paragraph (e) of §86.1844-01 refers to the Part 2 Application and items required as part of the Part 2 application. Paragraph (f) refers to running change submissions.”

§86.1844-01(b) states “Nothing in this section limits the Administrator’s discretion to require the manufacturer to submit additional records not specifically required by this section.”

# Ex. 4 CBI

Regards,

David

David Wright



Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

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**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Sent:** Monday, June 15, 2020 12:27 AM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

David,

Tesla agrees to EPA's request for submission of **Ex. 4 CBI** on the cadenced timeline set as long as these new requirements appear within the current regulations and/or guidance issued by the EPA. We want to reiterate that while this is an added burden to us, we want to demonstrate beyond doubt that our vehicles are compliant and truly meet the range we certify them under. We stand committed to be as transparent with the EPA as practical.

Tesla also has taken the EPA provided option to run a manufacturer's confirmatory test on the same vehicle. The confirmatory test completed this afternoon and results were as expected (411 miles). The data is now uploaded into EV-CIS and available for review.

1. Manufacturer's test conducted on June 8th 2020 yielded a result of 412 miles on the MCT.
2. **Manufacturer's confirmatory test** conducted on June 14<sup>th</sup> 2020 yielded a result of 411 miles on the MCT.

Based on our read of the 40CFR 600.008 language, when more than one confirmatory test results are available, the agency can ask for an average of the results. In this case, since only one confirmatory test was conducted, the results of the confirmatory test become official. This is more of a moot point in our case as averaging the results between the two tests does not have any impact on the results. The final value does end up at 411 miles.

We have calculated the final label values using the 411 miles MCT result and after applying the Sales weighted averages, we arrive at a final sticker value of 402 miles. I've attached a copy of the label calculation for your reference.

With this, I hope we have complied with all required regulatory obligations and we can begin production and deliveries of the new LR+ with a 402 mile FE label.

Suraj

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Sent:** Friday, June 12, 2020 4:54 PM

**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

# Ex. 4 CBI

# Ex. 4 CBI

EPA regulations describing how to update labels based on running change updates and perform the calculations can be found in 40 CFR 600.314

Let Tristin and I know how you would like to proceed for the confirmatory test.

Let me know if you have any questions regarding the information included in this e-mail. You will be receiving an e-mail from myself or Tristin next week to set-up a time and date to continue our discussions on vehicle performance along with some new topics addressing data vehicles and certification processes.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Friday, June 12, 2020 2:37 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

David,

Thank you again for the quick response again. I just wanted to re-iterate a few more points and I think we are finally very close to being on the same page.

1. Our latest submission is production representative of our current cell population. In other words, our FEDV absolutely represents what our customers will begin receiving

Ex. 4 CBI

Ex. 4 CBI

2. X axis on all charts represent the cell production date. There is a lag time between cell production date and vehicle production date. The time lag represents shipping, logistics, and production. The COVID-19 situation has resulted in longer-than-usual lag time.

3. We are open to share with you data of our production

Ex. 4 CBI

to continue to support our position.

With these, can we expect to receive the approval so we can move ahead with Production

Ex. 4 CBI

All

datasets have been available on EV-CIS as of last night.

Suraj

---

**From:** Wright, DavidA <Wright.DavidA@epa.gov>  
**Sent:** Friday, June 12, 2020 10:40 AM  
**To:** Suraj Nagaraj <snagaraj@tesla.com>; Vineet Mehta <vineet@tesla.com>; Rohan Patel <rohpatel@tesla.com>; Ray Wang <raywang@tesla.com>  
**Cc:** Cullen, Daniel <Cullen.Daniel@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>; Bunker, Byron <bunker.byron@epa.gov>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

# Ex. 4 CBI

If there are other issues or topics you want to discuss I am available this afternoon and would be willing to participate in a web conference if you feel that is necessary.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Suraj Nagaraj <snagaraj@tesla.com>  
**Sent:** Friday, June 12, 2020 12:27 PM  
**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Vineet Mehta <vineet@tesla.com>; Rohan Patel <rohpatel@tesla.com>; Ray Wang <raywang@tesla.com>  
**Cc:** Cullen, Daniel <Cullen.Daniel@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>; Bunker, Byron <bunker.byron@epa.gov>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

David,

I'm not sure if you've had a chance to see this updated chart I had attached to one of my responses... If we can get on a quick call , just you and me, I can try explain this better.

# Ex. 4 CBI

Suraj

---

**From:** Wright, DavidA <Wright.DavidA@epa.gov>

**Sent:** Friday, June 12, 2020 9:09 AM

**To:** Suraj Nagaraj <snagaraj@tesla.com>; Vineet Mehta <vineet@tesla.com>; Rohan Patel <rohpatel@tesla.com>; Ray Wang <raywang@tesla.com>

**Cc:** Cullen, Daniel <Cullen.Daniel@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>; Bunker, Byron <bunker.byron@epa.gov>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

Yes I did have a couple of typos in my prior response, I do apologize for the errors. The sentence you copied should have read – Tesla has not

Ex. 4 CBI

Ex. 4 CBI

# Ex. 4 CBI

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Sent:** Thursday, June 11, 2020 5:05 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

David,

We fully understand and agree with your first point. We will consult and inform EPA on any changes to the platform or settings before proceeding with our testing.

# Ex. 4 CBI

# Ex. 4 CBI

Suraj

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Sent:** Thursday, June 11, 2020 11:26 AM

**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

Regarding future testing of the Model S and X, the decision that EPA has made is based on the existing vehicle operation and current available driver selectable mode options. I expect that in the not too distant future Tesla will modify or change the existing driver selections and possibly add new mode options. As these changes are made Tesla needs to review the modifications with EPA and how that impacts vehicle road load or powertrain efficiency performance. The parameters used for testing need to be representative of how the vehicle operates on the road. Therefore, this methodology is based on the Model S creep mode being used predominantly in hold, with the regeneration mode option deleted, and the ride height mode set for automatic with the auto ride height settings continuing to perform as has been described to EPA. If there are changes to these systems and their operation then Tesla needs to describe the modifications to EPA and how Tesla proposes to test to capture the revised on-road operation. Therefore, as long as there are no changes to the design, operation, and use of these modes then the existing methodology applies.

# Ex. 4 CBI

# Ex. 4 CBI

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Thursday, June 11, 2020 12:53 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Hi David,

It's good to hear that EPA will accept our methodology on the RL calculation. We will continue to use that for all future tests on SX.

# Ex. 4 CBI



# Ex. 4 CBI

Can we get on a quick call today to discuss this ? We will try and work around your schedule. We are very close to closing this out and I'd like to keep the momentum going.

Suraj

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Sent:** Thursday, June 11, 2020 9:13 AM

**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

Having reviewed the calculations and data provided by Tesla for estimating the vehicle road load force when the vehicle is operating at standard ride height, EPA accepts the calculation methodology and the road load force blending methodology described by Tesla.

# Ex. 4 CBI

Let me know if you have any additional questions, or additional materials you would like to share with the Agency.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Wednesday, June 10, 2020 6:56 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

David,  
Thank you for the quick feedback. Please see my responses below. All test datasets and Decision information datasets are now available for your review on EV-CIS. If we have satisfactorily answered all your questions, could I ask for an approval (provisional or otherwise) by tomorrow morning ?

Suraj

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Sent:** Wednesday, June 10, 2020 2:45 PM  
**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

EPA staff have discussed the road load force analysis provided by Tesla and I expect we will have our response to your proposed blended road load force curve before close of business tomorrow. At this time we do not have any additional questions for Tesla regarding the road load force curve.

In our prior discussions with Tesla, Tesla staff have indicated that the vehicles and battery packs used for fuel economy testing were random selections from the production or pre-production build process and as such met EPA regulatory requirements. §86.1830(a)(2) states components affecting emissions which are used to build test vehicles

shall either be randomly selected from production parts or parts verified to be in the middle 50 percent of the tolerance range. The manufacturer will determine which components affect emissions (or range and consumption for EVs) using good engineering judgment.

# Ex. 4 CBI

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Sent:** Wednesday, June 10, 2020 12:55 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

\*Confidential\*

David,

# Ex. 4 CBI

Suraj

---

**From:** Wright, DavidA <Wright.DavidA@epa.gov>

**Sent:** Wednesday, June 10, 2020 7:28 AM

**To:** Suraj Nagaraj <snagaraj@tesla.com>; Vineet Mehta <vineet@tesla.com>; Rohan Patel <rohpatel@tesla.com>; Ray Wang <raywang@tesla.com>

**Cc:** Cullen, Daniel <Cullen.Daniel@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>; Bunker, Byron <bunker.byron@epa.gov>

**Subject:** RE: Slides for Vehicle Efficiency Calculations

Suraj,

Our internal team will get together to review and discuss the materials you have provided regarding the model-based blended RL curve, once we have completed our review I expect that we will respond to Tesla with any comments or questions the Agency might have.

EPA does have some questions based on the information you have provided in your e-mail. As I read your e-mail Tesla has replaced the battery pack in your existing Model S LR+ fuel economy data vehicle (FEDV). EPA's fuel economy and greenhouse gas regulations found in 40 CFR Part 600 outline the acceptability of vehicles used for fuel economy label testing. §600.07, Vehicle acceptability, defines the requirements for a vehicle to be acceptable for fuel economy testing. As I review this section it appears to me that the provisions of §600.07(b)(1) apply to the existing Model S LR+ FEDV. As noted in the last two sentences of that paragraph, *"The components installed for a fuel economy test are not required to be the ones with which the mileage was accumulated, e.g., axles, transmission types, and tire sizes may be changed. The Administrator will determine if vehicle/engine component changes are acceptable."*

Based on EPA's regulations it was the Agency's expectation that the blended road load curve would have been developed by Tesla, reviewed with EPA, and then the existing Model S LR+ FEDV would be tested using the new blended curve.

According to our reading of the regulations prior to swapping the battery pack Tesla needed to inform the Administrator of this plan and seek our approval prior to proceeding. As such, in addition, to reviewing the road load force curve EPA now needs to determine if the battery swap Tesla has performed is acceptable. Tesla had previously concluded that the pre-production Ex. 4 CBI cells were representative of the production intent cells and were sufficient

to generate representative fuel economy data. Does Tesla have any additional information they wish to share with the Agency regarding the decision to swap the battery pack, beyond the information provided in this e-mail?

The EPA team will meet later today and I expect that we will get back in touch with you prior to the close of business today regarding our review of the blended road load force curve and our timing for decision-making.

Let me know if you have any questions or need any additional information.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

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**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Wednesday, June 10, 2020 1:08 AM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Hi David,

My apologies for the delayed response. Per EPA's direction, we reran the MCT full discharge test using a model based blended RL curve to account for standard ride height below 50mph. The attached slides outline the methodology used to determine blending strategy. As we get ready to start production, the [redacted] cell pack has reached a representative level of maturity. Hence, for the MCT, we sourced a new more production representative pack (the older test was run on a pack with an early batch of pre-production [redacted] Ex. 4 CBI cells from the supplier) but used the same vehicle. All other aspects of the test and vehicle remain identical to the previous submission. The MCT tests have completed today and the test team is running some final checks on the data. We should have them ready for submission by mid-day tomorrow. Along with the datasets, we will also send you a couple of slides outlining the detailed test results and evolution of cell energy distribution (directly from the supplier) as we near start of production. We really want to bring this home this week as production has been stalled for more than a week now. We sincerely request EPA to expedite the review of the submitted datasets and give us the approval (provisional or otherwise) before COB Thursday.

Suraj

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Sent:** Wednesday, June 3, 2020 2:36 PM  
**To:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Cullen, Daniel <[Cullen.Daniel@epa.gov](mailto:Cullen.Daniel@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Snyder, Jim <[Snyder.Jim@epa.gov](mailto:Snyder.Jim@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>  
**Subject:** RE: Slides for Vehicle Efficiency Calculations

Tesla Team,

We have reviewed Tesla's request to use the 'low' ride height to determine road load forces for the UDDS cycle and analytically adjust the test result. At this time EPA believes that is not appropriate based on the vehicle never operating at low ride height in urban driving at the speeds observed on the UDDS. Also, after reviewing the Model S ride height distribution as a function of vehicle speed it is apparent to EPA that the appropriate approach for generating a road load force curve which is representative of vehicle operation is to use the 'standard' ride height road load force from 0 to 50 mph and the 'low' ride height road load force at speeds of 65 mph and above. The force curves between the 'standard' and 'low' ride height values are then blended between 50 and 65 mph. EPA has had discussions with numerous manufacturers over the years regarding their active aerodynamic features and the approach that is proposed here is the same approach EPA uses for all of industry on vehicles with active aerodynamic features.

EPA requires manufacturers supply representative road-load force data for their vehicles which is used when performing emissions and fuel economy testing. As noted in EPA guidance letter CD-15-04 Determination and Use of Vehicle Road-Load Force and Dynamometer Settings D.4. – For active devices (which are not driver controlled) which may behave differently during the coastdown test than during the emission test cycles or normal drive conditions, manufacturers shall seek EPA approval under CFR 86.1840 for determining the settings for coastdown testing and road-load force specification. Examples of these active devices are active grill shutters, active suspension height, and active aerodynamic features.

At this time EPA requests Tesla perform an MCT test on the running change Model S Long Range Plus using the blended road load force curve described in the first paragraph of this e-mail. The results from this new MCT will be used for determining the 2-cycle energy consumption and range for the Model S Long Range Plus running change.

Please let me know if you have any questions regarding our position and request to generate a blended road load force curve based on the 'standard' and 'low' ride height settings for this vehicle. Also, do not hesitate to contact us if you have any questions about the guidance letter.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Sent:** Monday, June 01, 2020 9:30 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>

**Subject:** Slides for Vehicle Efficiency Calculations

David, et al,

Here are the slides we reviewed earlier. This detailed analysis highlights a few points

1. An overview of losses that are captured in the Road load curve and exact definition of vehicle efficiency

2. Single point efficiency measurement as illustrated by the EPA spreadsheet is not representative as the value changes during the course of the test as the vehicle and powertrain heats up more than it did during the 2-HWFET cycle warmup before the derivations
3. Aggregate efficiency values over UDDS and HWFET cycles for Tesla vehicles fall between 80-90% range, and within our expectations
4. Based on our analysis, a couple of competitor vehicles seem to exhibit vehicle efficiency values at or above 100%

On the topic of ride height adjustment, the difference in aero drag coefficient between standard and low ride height is

**Ex. 4 CBI** This difference results in 0.35 miles and is likely to be within the test to test variability of the MCT. Even if we use a model adjusted set of coefficients, the test results will fall within the repeatability of the dyno test. Moreover, we mined our fleet data for distance driven at each of the ride height settings. Percent distribution for the Model S fleet turns out to be...

- Low: **Ex. 4 CBI**
- Standard: **Ex. 4 CBI**
- High: **Ex. 4 CBI**
- VeryHigh: **Ex. 4 CBI**
- VeryLow: **Ex. 4 CBI**

**Ex. 4 CBI**

Let us know if you have any further questions on either of these 2 topics. Looking forward to hearing from you tomorrow.

Vineet, Suraj, and Rohan.

## Message

**From:** Vineet Mehta [vineet@tesla.com]  
**Sent:** 1/27/2021 8:57:29 PM  
**To:** Bunker, Byron [bunker.byron@epa.gov]; Suraj Nagaraj [snagaraj@tesla.com]; Rohan Patel [rohpatel@tesla.com]  
**CC:** Cullen, Daniel [Cullen.Daniel@epa.gov]; George, Steve [george.steve@epa.gov]; McBryde, Dan [mcbryde.dan@epa.gov]; Rojeck, Tristin [rojeck.tristin@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]; Wright, DavidA [Wright.DavidA@epa.gov]  
**Subject:** Re: Response to Byron's note & Technical Meeting

Thanks for your note Byron.

Incidentally, I had drafted another detailed response to you this morning, but you beat me to it 😊. Here are my updated thoughts after thinking about the issue a bit more with a revised hypothesis on what may have happened during the October test, along with some responses to your note below in red.

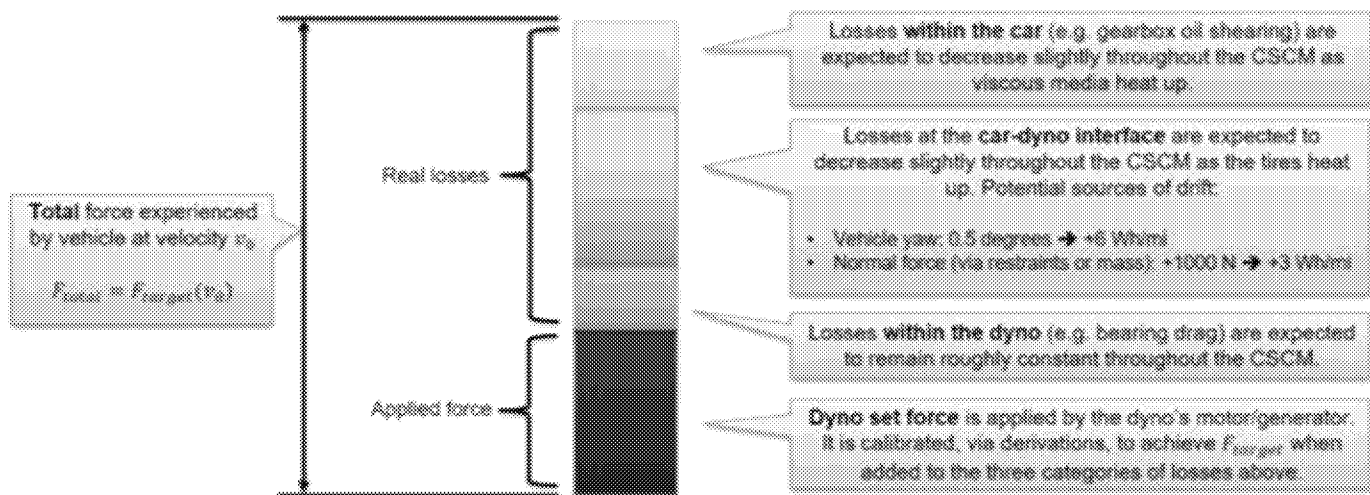
Apologies in advance for the back and forth, as I know it may be annoying to you and the team to get so many detailed emails. If nothing else, it's important for me to get the fundamentals correctly understood so we can keep getting better.

Hi Byron,

Thanks for sending the load cell data from the constant speed test with MS LR+ that was run in October. We have been thinking about it quite a bit. I replied to the EPA staff in response to some of the points you had raised. I also reached out to my old friend Carl Paulina who is now retired from the EPA. Over the years we have discussed many details related to dynos and I wanted to make sure I was thinking this matter correctly.

## Break-down of Constant Speed Force on Dyno

The total force experienced by vehicle is the sum of various contributions:



Some of the things Carl agreed with and highlighted to us...

1. The bar plot below represents a stack-up of the total force experienced by the car on the dyno. The red portion represents the force applied by the dyno motor and that represented by the load cell signal you sent. It does not include the losses at the car-dyno interface (green) or those within the car (yellow). If the green or the yellow bar were to vary, it would not have been captured by the red bar/load cell signal. Since it's part of the control loop, it is being driven by the motor/generator to achieve a target force.
2. 13N is a significant amount of drift and majority of the 3% tolerance band for EPA test. Moreover, if dyno force error during derivations is required to be within 10N, a drift beyond that value would be concerning



3. Apparent force should go down as the car's viscous drags reduce as tires, transmission oil, and other components get warmer during the course of the long MCT test.
4. EPA dyno gets calibrated very frequently and it's very likely that there were no issues with the dyno during the October test.

#### *Our hypothesis*

- More than likely the EPA dyno worked perfectly, but the green bar was likely changing during the constant speed section. This change was exacerbated after every 10min break when the driver would leave and re-enter the car. For instance, a 0.5 degree yaw in the way the car is mounted on the dyno could result in about 6 Wh/mi of extra consumption. Carl mentioned that this sensitivity is magnified with dual motor powertrains. It is not inconceivable that such a yaw would progressively increase ever so slightly every time the driver re-entered the car. As you know, a small force deviation on the dyno has a bigger impact on EVs than ICE vehicles.
- We have tested this car several times on our dynos. The consumption shown in the October test is not representative of this car. Occasionally, we also observe extra force deviation on the dyno. We unmount the car re-run the test, and the consumption usually lines right up. After your note, we tested 5 random VINs from the assembly line and ran MCTs on them. All of them showed an aggregate wh/mi close to our submitted value.

#### *Our ask*

Given the multiple sources of uncertainty present in dyno testing, it does not seem that one single test is enough to capture the capability of the vehicle. Ideally, an average of several tests would be most appropriate. Since that presents an onerous testing burden on the EPA, once possible alternative would be to establish a tolerance band for a confirmatory test results. If the confirmatory test result happens to be within X% of the submitted result, the submitted result stands. Since this likely requires change in the rules, at the very least, we request that the October test with the 13N drift not be included in the averaging. It is not representative of our submitted test result, and nor does it match the 5 random VINs we tested subsequently.

**Ex. 4 CBI**

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**From:** Bunker, Byron <bunker.byron@epa.gov>

**Date:** Wednesday, January 27, 2021 at 9:34 AM

**To:** Vineet Mehta <vineet@tesla.com>, Suraj Nagaraj <snagaraj@tesla.com>, Rohan Patel <rohpatel@tesla.com>

**Cc:** Cullen, Daniel <Cullen.Daniel@epa.gov>, George, Steve <george.steve@epa.gov>, McBryde, Dan <mcbryde.dan@epa.gov>, Rojeck, Tristin <rojeck.tristin@epa.gov>, Wehrly, Linc <wehrly.linc@epa.gov>, Wright, DavidA <Wright.DavidA@epa.gov>

**Subject:** RE: Response to Byron's note & Technical Meeting

Hi Vineet,

I appreciate the concerns highlighted in your e-mail to Tristin copied below with regards to the confirmatory testing completed at NVFEL but must point out that when we evaluate a test to determine if it is valid, that determination is made solely based upon the criteria in the Code of Federal Regulations (CFR). We understand, and the regulations were drafted giving consideration to the fact, that every measurement has some level of uncertainty and as a result every test has some degree of test-to-test variability. A difference between a test conducted by Tesla and one conducted by EPA is not a basis upon which to invalidate either test. The validity of either result is solely a function of the adherence to the testing requirements as defined in the CFR (presuming the test article itself isn't compromised in some way).

In one of the initial e-mails raising the concern of dynamometer drift, Tesla stated that the dynamometer drift was outside the bounds of the 10 N error band specified by SAE J2264 and incorporated into the CFR. This error band applies to the measured force during the dynamometer determination using the derived dynamometer set coefficients. Understood. But then, the regs are neglecting the fact that road load force does indeed drift during the course of the long test. The regs were written when individual cycles were being run to measure emissions and MPG, not for full discharge of EV's that go 400+ miles. The measured errors during the 3 coastdowns confirming the derived set coefficients were 5.9, 3.8, and 5.0 N. All of the confirmatory coastdowns met the J2264 error specification. The 10N force specification is not applicable to motor torque commanded deduced dynamometer load observed from tests consisting of different vehicles or the same vehicle at different laboratories. Apart from motor torque, we also used the battery voltage and current to deduce the higher road load, which ensures we are not relying on just one sensor in the car. Moreover, at the same laboratory (EPA), the road load force behaved as expected during one test (feb) and drifted up during another (October).

Although the differences highlighted in your previous note are not relevant to a determination regarding the validity of the test, we have looked into the concern and do not believe that the loading from EPA's dynamometer drifted during testing. The EPA dynamometers are not configured in the manner assumed by Tesla. On the EPA 1066 dynamometers, the motor shaft bearings are inside the control circuit of the dynamometer – it is a series path through the shaft bearing to the case-floating bearings to the load cell (see the attached diagram). Hence, the dynamometer would inherently compensate for any shaft bearing drift in the event there is drift, although none of our laboratory diagnostics showed any sign of drift on the first confirmatory test. Further as the dynamometer case is essentially static, and hence the bearings supporting the case aren't spinning, we would not expect whatever trivial force is reacted through those bearings to change during a test. I think you are correct that the dyno likely did not drift during the test. I agree with your rationale. However, the interaction between the vehicle and the dyno (green bar) changed steadily during the course of the MCT, which does not get captured by the dyno. See explanation and revised hypothesis above.

In short then, the confirmatory test performed on the MS LR+ was a valid test and becomes the official results pending a retest as requested by Tesla (scheduled for 1/28). If the 2nd confirmatory test falls within +/-3% of the initial confirmatory test, the results will be averaged. Once the testing is complete, we expect Tesla to adhere to the labeling provisions in 40CFR Part 600.

Thanks,

Byron

\*\*\*\*\*

Byron Bunker  
Director Compliance Division  
Office of Transportation and Air Quality  
Environmental Protection Agency  
2000 Traverwood Drive  
Ann Arbor, MI 48105  
[Bunker.Byron@epa.gov](mailto:Bunker.Byron@epa.gov)  
Phone: (734) 214-4155  
Mobile: (734) 353-9623

\*\*\*\*\*

**From:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Sent:** Tuesday, January 05, 2021 2:39 AM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

**Subject:** Response to Byron's note & Technical Meeting

Hi Tristin,  
Hope you had a good holiday break and happy new year!

I am writing to highlight a few more thoughts on the road load deviation from our side.

1. In Byron's note, he mentioned that, "...but we use the load cell measurement for both measuring torque and as an input to the test cell controller precisely because it is a highly repeatable measurement unlikely to experience the kinds of system drift suggested in the analysis you provided...". Please refer to the slide deck attached – the load cell measurement (red bar) itself is not representative of the total road load forces the car is experiencing. Moreover, since that sensor is part of the control loop, it will always read a steady state value representative of the torque the dyno is trying to produce.
2. Secondly, Byron mentioned that the apparent road load force going down through the MCT may indicate a problem with the Tesla dyno. I want to remind you that not only is this behavior expected but was also observed on EPA's confirmatory test in February. This behavior can be physically explained by components in both the vehicle and the dyno warming up, for example.
3. **Tesla is not saying that there is a fundamental flaw with EPA's dyno.** But that (a) there are multiple sources of uncertainty in dyno testing. For instance, a 0.5 degree yaw angle in vehicle mounting can result in ~5-6 wh/mi increase in consumption. And (b) occasional drift of road load force is not unusual. In our own dyno testing, we have observed a similar drift on occasion. Since the October test at EPA showed ~13N of deviation, we are asking to discard the test result from the averaging process. We sincerely believe it would be unfair to include this result in the averaging of the re-test result.

Lastly, we are asking to have a higher level conversation with yourself, David Wright, and others to discuss how to deal with similar events in the future. Current regulatory and testing framework doesn't allow a manufacturer or EPA to account for the inherent testing uncertainty in the process. How do we move forward such that there is a way to address these in the outcome of each confirmatory test to yield the most representative outcome? It is meant to be a high level technical discussion without focusing on any particular vehicle or carline. Could you please agree to make time for such a discussion over the coming week?

Sincerely,  
Vineet

Message

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**From:** Rohan Patel [rohpatel@tesla.com]  
**Sent:** 12/19/2020 3:07:34 PM  
**To:** Bunker, Byron [bunker.byron@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]  
**CC:** Wright, DavidA [Wright.DavidA@epa.gov]; Rojeck, Tristin [rojeck.tristin@epa.gov]; Suraj Nagaraj [snagaraj@tesla.com]  
**Subject:** RE: EPA Dynamometer

Byron,

Thanks very much to you and your team for looking into this. Tristin, please accept this email as confirmation of Tesla's request to retest.

As to the dynamometer drift issue, we could certainly be wrong as to our analysis, but there seems to be a consistency problem that is not explained by the load cell data. The reduction in apparent road load force in our MCT test is consistent with a similar reduction during EPA's February confirmatory test of this car – but not the most recent EPA test. Hence, the load cell data doesn't appear to explain why the EPA dyno behaved in a different manner between the two confirmatory tests. I think a phone call between our teams to discuss this inconsistency would be helpful, so that both EPA and Tesla can more fully explain our respective findings, and find a common understanding.

I appreciate your personal attention to this matter and wish the entire OTAQ team happy holidays.

Best,

Rohan

Rohan Patel | Senior Global Director, Public Policy and Business Development  
+1 317-532-7898 | [rohan@tesla.com](mailto:rohan@tesla.com)

**T E S L A**

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**From:** Bunker, Byron <bunker.byron@epa.gov>  
**Sent:** Thursday, December 17, 2020 5:47 PM  
**To:** Rohan Patel <rohpatel@tesla.com>; Wehrly, Linc <wehrly.linc@epa.gov>  
**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Subject:** RE: EPA Dynamometer

Dear Rohan,

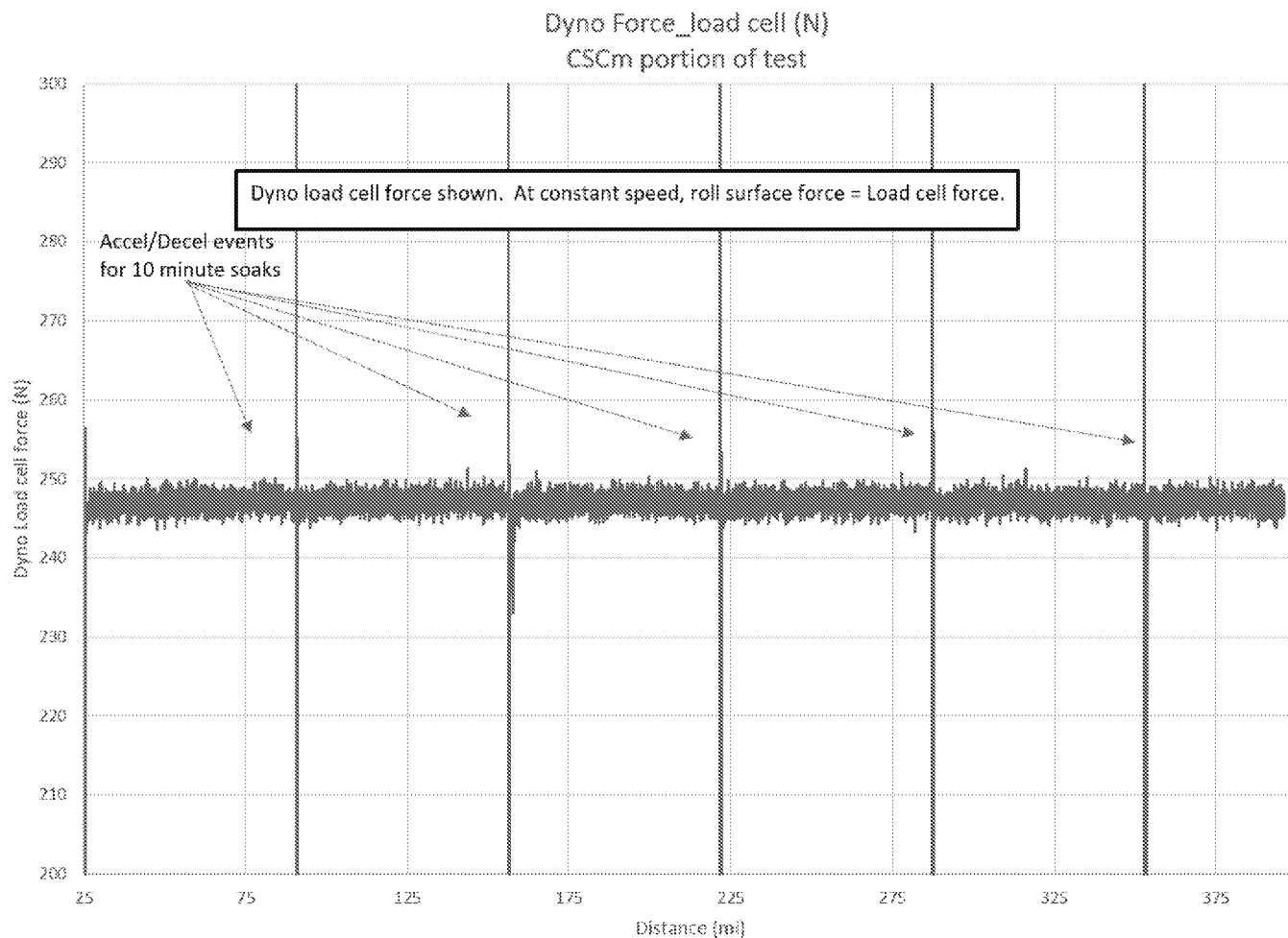
Our team followed up to investigate the potential concerns you raised regarding dynamometer drift. In very brief, we performed an analysis similar to Tesla's but in our case looking at the reacted force measured by the dynamometer load cell. That analysis copied below gives us no reason to believe that the dynamometer drifted during the test or any reason to invalidate the test results. It will probably be obvious to your team, but we use the load cell measurement for both measuring torque and as an input to the test cell controller precisely because it is a highly repeatable measurement unlikely to experience the kinds of system drift suggested in the analysis you provided. I assume that Tesla does the same in its test cells and does not use these inferred measures from the vehicle in your own operations. If you have not looked at the load cell results from your own testing, you should do so as the reduction in apparent road load over MCT as implied in the test results you shared with us could indicate a problem with Tesla's testing.

In any case, the test results conducted at NVFEL stand and will need to be substituted for the results Tesla provided previously unless you wish to seek a retest. If you do not request a retest within three days, we will take your failure to respond as acceptance of these test results. Please follow up directly with Tristin Rojeck to communicate Tesla's decision regarding retesting or accepting these confirmatory test results.

Best regards,

Byron

11:35:34 AM 11/19/2020



\*\*\*\*\*

Byron Bunker  
Director Compliance Division  
Office of Transportation and Air Quality  
Environmental Protection Agency  
2000 Traverwood Drive  
Ann Arbor, MI 48105  
[Bunker.Byron@epa.gov](mailto:Bunker.Byron@epa.gov)  
Phone: (734) 214-4155  
Mobile: (734) 353-9623

\*\*\*\*\*

---

**From:** Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>  
**Sent:** Friday, November 13, 2020 3:13 PM

ED\_006488\_00000051-00002

**To:** Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: EPA Dynamometer

Linc,

No problem and very much appreciate you looking into it. Hope you both have a great weekend.

Best,

Rohan

---

**From:** Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

**Sent:** Friday, November 13, 2020 2:35 PM

**To:** Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: EPA Dynamometer

Rohan,

Byron and I have talked and we are planning to meet with our lab to better understand whether they feel any drift of the dynamometer has occurred. We hope to meet with them next week and will let you know what we find out. Thank you for bringing this to our attention.

Regards,

Linc

---

**From:** Rohan Patel <[rohpatel@tesla.com](mailto:rohpatel@tesla.com)>

**Sent:** Monday, November 09, 2020 2:18 PM

**To:** Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** RE: EPA Dynamometer

Linc and Byron,

So sorry to bother you, but just wanted to make sure the email didn't get lost in an email filter?

Thanks,

Rohan

---

**From:** Rohan Patel

**Sent:** Thursday, November 5, 2020 10:01 AM

**To:** Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Bunker, Byron <[bunker.byron@epa.gov](mailto:bunker.byron@epa.gov)>

**Subject:** EPA Dynamometer

Byron and Linc,

Hope you're both well. Our team had a recent phone conversation regarding a recent confirmatory test of the Tesla Model S LR+ with members of the EPA team. In that conversation and explanatory email, EPA staff did not acknowledge what we see as either a physical or operational problem with the EPA Dyno and the significant drift that it exhibits. The dyno road load force and its drift is not consistent between EPA's tests in February and October. We'd like to have a discussion with the EPA leadership so we can understand if our conclusions are erroneous or there is a good explanation of this irregularity, which we believe had a material negative impact on the confirmatory test.

In the meantime, we will run new MCT tests on randomly selected vehicles, with the exact same EPA protocols (10 minute breaks, which as you know is optional), and provide that data on our dyno performance. We think these additional tests will provide further evidence of an EPA dyno that is not performing consistently. Below are some of the plots, that we can go through at your convenience and we don't expect it would take more than 15 minutes or so. My assumption is that EPA wants to have a consistent road load force from test to test and during the duration of these tests for all manufacturers, but unfortunately that does not seem to be the case based on the data we have analyzed.

We'd very much appreciate a short meeting with you and would be happy to set it up at your convenience.

Best,

Rohan

Rohan Patel | Senior Global Director, Public Policy and Business Development  
+1 317-532-7898 | [rohan@tesla.com](mailto:rohan@tesla.com)

TESLA

TESLA

**Ex. 4 CBI**

# Ex. 4 CBI



Message

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**From:** Rojeck, Tristin [rojeck.tristin@epa.gov]  
**Sent:** 3/18/2021 8:53:18 PM  
**To:** Ray Wang [raywang@tesla.com]  
**CC:** Wright, DavidA [Wright.DavidA@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]; Suraj Nagaraj [snagaraj@tesla.com]; Bunker, Byron [bunker.byron@epa.gov]  
**Subject:** RE: 2021 Tesla Model S Long Range  
**Attachments:** 2021-02-09-MDLG-1596\_GR-MS\_LR\_pack\_selection.pptx; Tesla August Cell Data For EPA.pptx; MS 419989 Tests and Maintenance.Pdf

Hello Ray,

These questions are very helpful and important. Below are EPA responses to each question:

## Ex. 4 CBI

- a. Please provide an updated cell lot dataset (similar to the dataset provided for SD321-419989) and where the new battery pack lies within the dataset.
  - i. Yes, email is acceptable. I will confirm, via email, the EPA disposition on if the battery pack is acceptable.
  - ii. For reference, attached is an example of the cell lot dataset provided for SD321-419989.
- b. In addition, EPA requests that Tesla provide the cell lot capacity distribution in monthly reports for the Model Year 2021 Model S Long Range.
  - i. An example of the cell data summary from August 2020 for the 20MY Model S Long Range Plus is included for reference, but EPA will also expect the individual cell capacities in a .zip file as provided in the past.

## Ex. 4 CBI

- a. The current plan is acceptable. Thank you for the clarification on the VIN randomization.
- b. Please inform the Agency if any vehicle updates, wheel alignments or unscheduled maintenances occur on the data vehicle.
- c. When the tests are submitted in a CTDI (waiver) request, please provide a similar log to that provided for the vehicles currently at EPA with the vehicle derivation/testing log and maintenance/mileage accumulation log.
- i. For reference, attached is an example of the logs provided for SD321-419989.

The lack of support for testing SD321-419989 is disappointing. The reason that EPA had planned to complete this experimental testing was to evaluate the Tesla hypothesis that the air-suspension impacted loads experienced by vehicles during previous testing at NVFEL. At this time, we have not updated the 2021 Model S Long Range Plus on FuelEconomy.gov due to that we have not had a chance to substantiate the ride-height/air-suspension claim. Without further testing, EPA will consider the matter closed and the MS LR+ dataset will be uploaded with the next scheduled release (3/23).

Please let me know if you have any further questions on the topics discussed.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division

Office of Transportation and Air Quality

U.S. Environmental Protection Agency

(734) 214-4649

---

**From:** Ray Wang <raywang@tesla.com>  
**Sent:** Wednesday, March 17, 2021 8:00 PM  
**To:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Subject:** RE: 2021 Tesla Model S Long Range

Hi Tristin,

**Ex. 4 CBI**

Let me know if you have any questions.

Regards,  
Ray Wang

Sr Homologation Engineer  
901 Page Ave. Fremont, CA 94538  
E: [raywang@tesla.com](mailto:raywang@tesla.com) T: (612) 940-3608

T E S L A

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**From:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Sent:** Wednesday, March 17, 2021 1:48 PM  
**To:** Ray Wang <raywang@tesla.com>  
**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Bunker, Byron

<bunker.byron@epa.gov>; Suraj Nagaraj <snagaraj@tesla.com>

**Subject:** RE: 2021 Tesla Model S Long Range

Hello Ray,

I appreciate the call earlier requesting clarification on 5-cycle testing. As we discussed, EPA expects all fuel economy testing to be completed on the new Model S Long Range FEDV after mileage accumulation. This includes 5-cycle testing. Could you please provide Tesla's battery and vehicle selection process/criteria? It sounded like the vehicle is planned to be the next Model S Long Range off the production line and the battery pack is planned to be selected in accordance with §86.1830-01(a)(2). This sounds reasonable, but please confirm the details when you get a chance.

I will follow up later today or early tomorrow regarding the Model 3 LR AWD. Also, do you have any update on the ability to lock the air-suspension and update the "UI Watchdog" remotely for SD321-419989?

Thanks,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division

Office of Transportation and Air Quality

U.S. Environmental Protection Agency

(734) 214-4649

---

**From:** Rojeck, Tristin

**Sent:** Wednesday, March 17, 2021 1:34 PM

**To:** 'Suraj Nagaraj' <snagaraj@tesla.com>

**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Bunker, Byron <bunker.byron@epa.gov>; Davis, Julian <davis.julian@epa.gov>; Ray Wang <raywang@tesla.com>

**Subject:** 2021 Tesla Model S Long Range

Hello Suraj,

The practice of installing a replacement battery or swapping a battery on a Fuel Economy Data Vehicle (FEDV) is a significant issue. After consultation with our in-house legal counsel and discussions with Byron, it has been determined by EPA that J1634 is incorporated by reference only for application to the regulations in 40 CFR §600.116-12(a) and §600.311-12(j)-(k) which describe vehicle test procedures and fuel economy calculations. The regulations that speak to vehicle acceptability and mileage accumulation are §600.007 and 40 CFR §86.1831-01. Based on this determination, the Model S Long Range FEDV (VID: SD321-419989 / 0) has been deemed unrepresentative for fuel economy labeling purposes due to improper mileage accumulation on the data vehicle.

Please select a new Model S Long Range FEDV then complete vehicle aging and testing pursuant to EPA regulations. EPA's expectation is that Tesla uses a regulatorily described method for selecting components for a data vehicle (§86.1830-01(a)(2)). Next, the vehicle, in its entirety (including the production representative battery pack), should be driven over a minimum of 2,000 miles of mileage accumulation cycles (unless Tesla has analysis demonstrating stabilization of the vehicle in terms of consumption and range between 1000-2000 miles consistent with the allowance

in §86.1831-01(c)). Please communicate with EPA prior to the component/vehicle selection and mileage accumulation processes to confirm alignment on each topic.

In parallel, EPA is planning to perform experimental testing on the Model S Long Range (VID: SD321-419989) currently in EPA possession. The anticipated timeline is to complete a road-load derivation on Thursday (3/18) and complete an MCT on Friday (3/19). This experimental testing will be used to evaluate the impact of ride-height/air-suspension on the road load force and dynamometer set coefficients compared to the void test from February. This will not be an official test.

Would it be possible for Tesla to push software over-the-air to lock the suspension of the Model S Long Range (VID: SD321-419989)? In addition, if the "UI Watchdog" has been deemed production representative, could this also be updated remotely? We are open to a Tesla representative installing the software onsite, but this would need to occur early tomorrow morning (3/18). EPA plans to reconnect the original 12V battery into the vehicle tomorrow morning prior to the RLD and prep activity. Could you please tell me the current SOC of the HV battery pack for the MS LR (VID: SD321-419989)? I would like to ensure that the vehicle is currently in or near the acceptable SOC range (50-70%) for road-load derivations.

Please let me know if you need any clarifications on these requests.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division

Office of Transportation and Air Quality

U.S. Environmental Protection Agency

(734) 214-4649

Message

---

**From:** Suraj Nagaraj [snagaraj@tesla.com]  
**Sent:** 3/29/2021 8:48:36 PM  
**To:** Wehrly, Linc [wehrly.linc@epa.gov]; Ray Wang [raywang@tesla.com]  
**CC:** Rojeck, Tristin [rojeck.tristin@epa.gov]; Wright, DavidA [Wright.DavidA@epa.gov]; Bunker, Byron [bunker.byron@epa.gov]; Rohan Patel [rohpatel@tesla.com]  
**Subject:** RE: 2021 Tesla Model S Long Range

Hi Linc,

Thanks for reaching out. Its news to me that the car is still at the EPA. The test team should have retrieved it last week and I have reached out to them to find out why that hasn't happened. I suspect the COVID related shutdown at the EPA had something to do with this. A second (less prominent) reason for us to be hesitant about the experimental testing of the [REDACTED] was around the fact that Tesla has been given certain Timeslots for confirmatory testing and we were told that these were a use-it or lose-it type of deal. We had a Model Y and a Model 3 already in the queue. With the [REDACTED] testing delayed, we preferred that the test slot was best used for Model Y/3 testing. If that is our misunderstanding, I apologize. The replacement Model S LR vehicle is currently on the dyno accumulating miles and we expect to have all tests ( 5 cycle + MCT) completed by Tuesday next week and can work to make the car available to the EPA by 4/12. We also expect to request a retest on the Model 3 EPA tested recently (results were >3% of our numbers) . With these two production impacted vehicle lines in queue for testing, we'd prefer that any experimental testing be deferred to a later time but if EPA can assure us that these two are mutually exclusive and won't affect the timeline for the official CT on the Model S and Model 3, I'm happy to work with the firmware team and have a new version of the dyno mode (with the suspension lock out) flashed onto that vehicle. I'd also like us to agree on the disposition of the outcome from this experimental test so we have no confusion later.

Kind Regards

Suraj

---

**From:** Wehrly, Linc <wehrly.linc@epa.gov>  
**Sent:** Monday, March 29, 2021 1:05 PM  
**To:** Ray Wang <raywang@tesla.com>  
**Cc:** Suraj Nagaraj <snagaraj@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>; Wright, DavidA <Wright.DavidA@epa.gov>; Bunker, Byron <bunker.byron@epa.gov>  
**Subject:** 2021 Tesla Model S Long Range

Ray,

I hope you are doing well. The year is going by very fast. I can't believe it is almost April!

When Tristin reached out to you on March 17<sup>th</sup> about possibly locking the air shocks on the Model S LR vehicle that we had here in Ann Arbor to perform a test to validate Tesla's claim about the variable ride height system impacting the range results, your response below indicated that Tesla needed the vehicle back and that perhaps you could help with this experimental testing at a future time. My question for you is that it has been over two weeks and the vehicle is still in Ann Arbor at our lab. We could have easily performed our test by now. In fact, we still have an opportunity to test the vehicle this week or possibly next week. Would you be able to help lock the air shocks so that we can perform the test?

Please let me and Tristin know what you think.

Thanks,  
Linc

Linc Wehrly

Director, Light-Duty Vehicle Center  
Compliance Division  
Office of Transportation and Air Quality  
United States Environmental Protection Agency  
(734) 214-4286  
[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Sent:** Wednesday, March 17, 2021 8:00 PM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Subject:** RE: 2021 Tesla Model S Long Range

Hi Tristin,

Regarding the battery and vehicle selection process/criteria, battery pack will be manually selected to ensure the capacity fits within the 50<sup>th</sup> percentile in accordance with §86.1830-01(a)(2). Will you need another cell lot data file or any form of document to demonstrate the battery choice? Will confirming it via email be sufficient? In terms of the vehicle, the VIN is randomly selected and installed with the manually selected pack. It is still the case that vehicle selection follows the random selection protocol we shared in the past. Similar with the battery selecting process, is there a particular type of confirmation you are looking for? Can we confirm the vehicle is still random selection via email?

In terms of the remotely updates, it is possible to send out the updates remotely for the SD321-419989. But, we have a shortage of test vehicles and further tests are planned on this one. Having it back can ease the pressure of limited testing vehicles. So, we may end up asking for sending this one back to us. A new MS LR can totally be provided in a few months to support all your experiment tests.

Let me know if you have any questions.

Regards,  
Ray Wang

Sr Homologation Engineer  
901 Page Ave, Fremont, CA 94538  
E. [raywang@tesla.com](mailto:raywang@tesla.com) T. (612) 940-3608

Message

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**From:** Rojeck, Tristin [rojeck.tristin@epa.gov]  
**Sent:** 4/30/2021 4:15:18 PM  
**To:** Suraj Nagaraj [snagaraj@tesla.com]; Ray Wang [raywang@tesla.com]  
**CC:** Wright, DavidA [Wright.DavidA@epa.gov]; Cullen, Daniel [Cullen.Daniel@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]; Ott, William [ott.william@epa.gov]; Bunker, Byron [bunker.byron@epa.gov]; Snyder, Jim [Snyder.Jim@epa.gov]  
**Subject:** RE: MY2021 Model S Long Range application

Hello Suraj,

Thank you for taking my call earlier.

Unfortunately, we have no authority to waive the speed trace tolerances described in 40 CFR 86.115-78. Furthermore, we have no avenue for allowing a manufacturer to use on-board current measurements as test data during official test processes. Based on all available information provided to the Agency, the Tesla internal MCT should be deemed void. I would like to provide two options as next steps for this vehicle:

1. Tesla could retest the MCT and submit a revised CTDI request with the 5-cycle testing and the valid MCT.
  - a. Once the information is submitted, EPA would make a decision on confirmatory testing.
  - b. EPA confirmatory testing (if applicable) would likely occur 1-2 weeks after CTDI submission
2. Tesla could send EPA the MS LR (VID: SD321-428324) and our first valid test would become the official results.
  - a. There would not be a paired manufacturer MCT to establish retest criteria based on +/-3% combined range or FE.
  - b. EPA could likely complete confirmatory testing next Thursday (5/6) withstanding COVID related testing issues.

In either scenario, the Tesla MCT is a void test. EPA does not have the ability to allow for deviations from the drive cycle for manufacturer conducted testing or to allow for on-board current measurement. The options provided are limited to this vehicle due to the specific circumstance and should not become normal practice.

To follow up on a few of the other topics included in the slide deck, EPA is comfortable with Tesla's decision to omit the 30<sup>th</sup> Cold UDDS from the calculation due to a consumption sampling error as this will worst case the 5-cycle adjustment factor. Thank you for the explanation of the heat pump as well. Also, for reference, EPA samples current during the soak periods of the 65 MPH SS section of the MCT testing and uses the voltage from the memorator to include the UBE consumed during the soak time towards the total UBE. This seems consistent with Tesla's internal practice.

Before EPA begins confirmatory testing, can you please confirm that the ride height will be locked in a manner that will not impact the validity of the upcoming confirmatory test process? I understand that this program is time sensitive so I would like to ensure that all settings and procedures are clearly stated prior to EPA receiving the vehicle. We understand, for example, that the accelerations to 65MPH steady state must not be overly aggressive as to not exceed the 500A Hioki clamp range, but please put this in a test instructions packet. The Hioki clamp installation will also be different compared to previous vehicles tested by EPA, so please provide instructions for this installation as well.

Please let me know when you have a final decision on next steps and/or if you have any questions.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency

(734) 214-4649

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**From:** Ray Wang <raywang@tesla.com>  
**Sent:** Thursday, April 29, 2021 4:29 PM  
**To:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Suraj Nagaraj <snagaraj@tesla.com>; Cullen, Daniel <Cullen.Daniel@epa.gov>; Ott, William <ott.william@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Wright, DavidA <Wright.DavidA@epa.gov>  
**Subject:** RE: MY2021 Model S Long Range application

Hi Tristin,

## Ex. 4 CBI

Regards,  
Ray Wang

Sr Homologation Engineer  
901 Page Ave, Fremont, CA 94538  
E. [raywang@tesla.com](mailto:raywang@tesla.com) T. (612) 940-3608

T E S L A

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**From:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Sent:** Thursday, April 29, 2021 9:16 AM  
**To:** Ray Wang <raywang@tesla.com>  
**Cc:** Suraj Nagaraj <snagaraj@tesla.com>; Cullen, Daniel <Cullen.Daniel@epa.gov>; Ott, William <ott.william@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Wright, DavidA <Wright.DavidA@epa.gov>  
**Subject:** RE: MY2021 Model S Long Range application

Hello Ray,

After taking some time to review the presentation, we have a question regarding the Cold UDDS testing. Could you please explain why the offset in consumption occurred between the 31<sup>st</sup> and 32<sup>nd</sup> UDDS (plot on pg. 5)? It seems that the higher consumption (~260 Wh/mi) continued for the remainder of the charge depletion testing. Is there something new on the Ex. 4 CBI vehicles that explains these results? This does not match the consumption profile over full depletion Cold UDDS cycles performed on previous Tesla MS/MX vehicles that we have evaluated.

We may follow-up with a few additional questions early this afternoon.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

ED\_006488\_00000061-00002



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**From:** Wright, DavidA <Wright.DavidA@epa.gov>

**Sent:** Thursday, April 29, 2021 8:41 AM

**To:** Ray Wang <raywang@tesla.com>

**Cc:** Suraj Nagaraj <snagaraj@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>; Cullen, Daniel <Cullen.Daniel@epa.gov>; Ott, William <ott.william@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>

**Subject:** FW: MY2021 Model S Long Range application

Ray,

Thank you for sharing the detailed issues Tesla encountered on the MCT and the 20 F charge depletion testing of the MS Long Range. Our staff need time to review these issues and evaluate whether we concur with Tesla that both of these are valid tests with the issues that occurred. I do not know that we will meet your timing and I also do not know when the laboratory will be able to schedule this vehicle for a confirmatory test.

We will get back with you as soon as we have had the opportunity to reach a decision on the test anomalies and understand the laboratory availability.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency

---

**From:** Ray Wang <raywang@tesla.com>

**Sent:** Wednesday, April 28, 2021 11:00 PM

**To:** Rojeck, Tristin <rojeck.tristin@epa.gov>

**Cc:** Suraj Nagaraj <snagaraj@tesla.com>

**Subject:** MY2021 Model S Long Range application

Hi Tristin,

# Ex. 4 CBI

# Ex. 4 CBI

Please feel free to ask if you have any questions.

Regards,  
Ray Wang

Sr Homologation Engineer

901 Page Ave, Fremont, CA 94538

E. [raywang@tesla.com](mailto:raywang@tesla.com) T. (612) 940-3608

T E S L A

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Message

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**From:** Suraj Nagaraj [snagaraj@tesla.com]  
**Sent:** 6/1/2021 8:18:50 PM  
**To:** Ray Wang [raywang@tesla.com]; Rojeck, Tristin [rojeck.tristin@epa.gov]  
**CC:** Wright, DavidA [Wright.DavidA@epa.gov]; Bunker, Byron [bunker.byron@epa.gov]; Rohan Patel [rohpatel@tesla.com]  
**Subject:** 2021 MS Plaid - Request for expedited approval

Hi Tristin, David and Byron,

Tesla has planned a delivery event planned for **Ex. 4 CBI** customers. We ran into some issues with our testing schedule on Plaid and just finished mileage accumulation on the FEDV and will begin 5 cycle + MCT testing early tomorrow. As Ray has pointed out, we hope to have the submission in VERIFY by **Ex. 4 CBI**. I realize this does not provide EPA the typical review timeframe but we would be super appreciative if EPA can approve the CoC for this variant by **Ex. 4 CBI** so we can continue with our delivery event. Not being able to deliver cars on **Ex. 4 CBI** to Tesla and I'd like to request EPA's help in avoiding that. I humbly apologize for routinely putting EPA through these fire drills but it makes me feel better that these delays are the result of us following test protocols to the highest degree with zero deviations from EPA's expectation of us. When we submit the results, we will be confident that there are no inconsistencies.

With this, would EPA be willing to approve the CoC by **Ex. 4 CBI** and in case of this vehicle being chosen for Confirmatory testing, issue a conditional approval by **Ex. 4 CBI**?

Suraj Nagaraj | Sr. Director, Homologation  
901 Page Ave, Fremont, CA 94538  
p. +1 (510) 249-8749 | m. +1 (510) 301-4607 | [snagaraj@tesla.com](mailto:snagaraj@tesla.com)

**T E S L A**

Message

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**From:** Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]  
**Sent:** 3/10/2017 6:27:21 PM  
**To:** Suraj Nagaraj [snagaraj@tesla.com]  
**Subject:** RE: [Fueleconomy] 2017 Tesla Model S 100D - question from one of your customers

Thanks Suraj

I'll send a short reply to your customer.

Dave

---

**From:** Suraj Nagaraj [mailto:snagaraj@tesla.com]  
**Sent:** Friday, March 10, 2017 12:44 PM  
**To:** Good, David <good.david@epa.gov>  
**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>  
**Subject:** RE: [Fueleconomy] 2017 Tesla Model S 100D - question from one of your customers

Hi Dave,

Thanks for the heads up. We are getting a lot of pressure from our customers to get these MS and MX 100D delivered. Even though the MS 100D is has a conditional approval, I am waiting for David Wright to issue the COC for the MX100D. We spoke last night and it looks like all issues have been resolved and the COC should be approved today. We ideally want to deliver both MS and MX vehicles to our customers at the same time to avoid any further questions. We have communicated to our customers that all approvals should be in place by 3/13 (Monday).

Suraj

---

**From:** Good, David [mailto:good.david@epa.gov]  
**Sent:** Friday, March 10, 2017 7:57 AM  
**To:** Suraj Nagaraj <snagaraj@tesla.com>  
**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>  
**Subject:** RE: [Fueleconomy] 2017 Tesla Model S 100D - question from one of your customers

Suraj,

See the customer's email message below.

Since Tesla used the conditional FE Labeling provisions for the MS 100D, it's my understanding that this customer's vehicle should have a FE Label (and a certificate) and that Tesla can introduce the MS 100D into commerce.

Please advise.

Thanks

Dave

---

**From:** Boundy, Robert Gary [mailto:boundyrg@ornl.gov]  
**Sent:** Friday, March 10, 2017 10:37 AM  
**To:** Good, David <good.david@epa.gov>  
**Subject:** FW: [Fueleconomy] 2017 Tesla

Hello Dave,

Is this something you could address?

Bob

Bob Boundy

Roltek, Inc. Supporting:

Oak Ridge National Laboratory

Phone: (865) 850-0766

Email: [boundyrg@ornl.gov](mailto:boundyrg@ornl.gov)

---

**From:** **Ex. 6 Personal Privacy (PP)**

**Sent:** Friday, March 10, 2017 9:24 AM

**To:** FuelEconomy <[fueleconomy@ornl.gov](mailto:fueleconomy@ornl.gov)>

**Subject:** [FuelEconomy] 2017 Tesla

I ordered a 2017 Tesla model S with the new 100D battery pack. My car in is the showroom but they claim they can't release it until the EPA rates the battery. Is this correct? If so any idea when you may test the battery?

Thank you,

**Ex. 6 Personal Privacy (PP)**

**To:** Dan Wohl[dwohl@tesla.com]; Wright, DavidA[Wright.DavidA@epa.gov]  
**Cc:** Ott, William[ott.william@epa.gov]; Rojeck, Tristin[rojeck.tristin@epa.gov]; Ana Stewart[astewart@tesla.com]  
**From:** Good, David[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]  
**Sent:** Tue 5/1/2018 8:56:10 PM (UTC)  
**Subject:** RE: Discuss NMOG+NOx Fleet Credits  
Tier2 2001.103.ppt  
DRAFT Light-duty Tier 3 AB&T Calculator (009)-djg-Apr 26-2018.xlsm

Dan & Ana,

### Tier 2 AB&T:

See attached Tier 2 presentation, slides 21-32, especially slide 32. Since the Tier 2 program ended on Dec 31, 2016 (and also because EPA is not aware of any manufacturer who certified above the emission standards and is in the market to purchase Tier 2 emission credits); we don't believe that it is appropriate for Tesla to calculate Tier 2 credits retroactively. As outlined in the provisions of 40 CFR 86.1862-04(c)(4) the 2016 AB&T report was due to EPA on or before May 1, 2017 and failure to submit the report is a violation of the CAA requirements, as follows:

§86.1862-04 Maintenance of records and submittal of information relevant to compliance with fleet-average standards.

\* \* \*

#### *c) Reporting.*

\* \* \*

(4) Unless a manufacturer reports the data required by this section in the annual production report required under §86.1844-01(e) and subsequent model year provisions, a manufacturer must submit an annual report for each model year after production ends for all affected vehicles produced by the manufacturer subject to the provisions of this subpart and no later than May 1 of the calendar year following the given model year. Annual reports must be submitted to: Director, Compliance Division, U.S. Environmental Protection Agency, 2000 Traverwood, Ann Arbor, Michigan 48105.

(5) Failure by a manufacturer to submit the annual report in the specified time period for all vehicles subject to the provisions in this section is a violation of Clean Air Act section 203(a)(1) (42 U.S.C 7522(a)(1)) for each subject vehicle produced by that manufacturer.

Note that the provisions of 40 CFR 86.1860-04(c)(2) read as follows:

§86.1860-04 How to comply with the Tier 2 and interim non-Tier 2 fleet average NO<sub>x</sub> standards.

\* \* \*

(c)(2)(i) For model years up to and including 2008, if a manufacturer certifies its entire U.S. sales of Tier 2 or interim non-Tier 2 LDV/LLDTs or interim non-Tier 2 HLDT/MDPVs, to full useful life bins having NO<sub>x</sub> standards at or below the applicable fleet average NO<sub>x</sub> standard, that manufacturer may elect not to compute a fleet average NO<sub>x</sub> level for that category of vehicles. A manufacturer making such an election must not generate NO<sub>x</sub> credits for that category of vehicles for that model year.

(ii) For model years after 2008, if a manufacturer certifies its entire U.S. sales of Tier 2 vehicles to full useful life bins having NO<sub>x</sub> standards at or below 0.07 gpm, that manufacturer may elect not to compute a fleet average NO<sub>x</sub> level for its Tier 2 vehicles. A manufacturer making such an election must not generate NO<sub>x</sub> credits for that model year.

We assumed that Tesla was using the provisions of 86.1860-04(c)(2) to satisfy your Tier 2 AB&T reporting requirements---although technically an annual AB&T report is required, ref. 86.1862-04(c), which reads as follows:

§86.1862-04 Maintenance of records and submittal of information relevant to compliance with fleet-average standards.

\* \* \*

(c) *Reporting.* (1) Each manufacturer must submit an annual report. Except as provided in paragraph (b)(2) of this section, the annual report must contain, for each applicable fleet average standard, the fleet average value achieved, all values required to calculate the fleet-average value, the number of credits generated or debits incurred, all the values required to calculate the credits or debits, and sufficient information to show compliance with all phase-in requirements, if applicable. The annual report must also contain the resulting balance of credits or debits.

(2) When a manufacturer calculates compliance with the fleet-average standard using the provisions in §86.1860-04(c)(2) or §86.1860-17(f), the annual report must state that the manufacturer has elected to use such provision and must contain the fleet-average standard as the fleet-average value for that model year.

### Tier 3 AB&T:

See attached a set of DRAFT Tier 3 AB& T templates. Please don't use these templates until they are finalized. The (mouse over) comments to the various cells of the calculators provide the applicable Tier 3 regulations. I won't send you the Evap/HDV/Cold NMHC templates since they are not applicable to Tesla EVs. For example, for evaporative (HS+D) AB&T program, electric vehicles, diesel vehicles and dedicated CNG vehicles are not included in the spreadsheet AB&T calculations; ref. §86.1813-17 introductory paragraph and §86.1813-17(a)(2)(i).

For the Cold NMHC AB&T program, test groups containing electric vehicles, diesel vehicles or dedicated CNG vehicles are not included in the Cold AB&T program. Multi-fueled, bi-fueled, dual fueled, and flexible-fueled vehicles must comply using gasoline test fuel only; ref. §86.1811-17(g).

I am working on an extension of the May 1, 2018 due date for sending your 2017 AB&T Tier 3 end of year report to EPA---my supervisor just needs to touch base our division director (and our division director is sometimes hard to catch). I'll let you know about the extension in the next day or so. I don't expect there will be any problems approving the extension.

### Overview of the Tier 3 AB&T Templates:

Attached are a full set of DRAFT Tier 3 AB&T light-duty calculators which can be used by manufacturers to provide EPA with their Tier 3 annual AB&T report due on May 1 after the end of the model year, ref. 86.1862-04(c).

The templates are not protected, so you can see the formulas for each cell. Eventually I hope to publish the templates on the web or send them out in an EPA guidance letter (with some cells and calculations protected).

There are DRAFT example templates for 1) single model year Tier 3 AB&T calculations and 2) multiple model year Tier 3 AB&T tracking for the following emission categories:

- Tier 3 Light-duty (LDV/LDT1) FTP/SFTP (NMOG + NOx) AB&T—(including 120K full useful life option and the 150K full useful life option),
- Tier 3 Light-duty (LDT2/HLDT/MDPV) FTP/SFTP (NMOG + NOx) AB&T (150K full useful life option only),

Highlights of the Light-duty Excel file :

- Instructions are contained in the first two tabs in the (mouse over) cell A6 for both);
- Manufacturers may enter data as needed for model years 2015 through 2027 model years;
- Use the "LDV,LDT1" tab (spreadsheet) for LDV and LDT1 vehicles.
- Use the "LDT2, HLDT,MDPV" tab (spreadsheet) for those classes of vehicles.
- Four spreadsheets provide examples of Summary AB&T tracking over several model years for FTP and SFTP compliance for the 120K full useful life fleet average option (if applicable) and for the 150K full useful life fleet average option.

Hope this helps.

Call me if you have any questions about using the DRAFT template.

Dave Good, Engineer  
U.S. EPA  
734-214-4450

**From:** Dan Wohl [mailto:dwohl@tesla.com]

**Sent:** Tuesday, May 01, 2018 2:02 PM

**To:** Wright, DavidA <Wright.DavidA@epa.gov>

**Cc:** Ott, William <ott.william@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>; Good, David <good.david@epa.gov>; Ana Stewart <astewart@tesla.com>

**Subject:** RE: Discuss NMOG+NOx Fleet Credits

David, David, and William,

Thanks for your time and guidance this morning on Tier 2 NOx and Tier 3 NMOG+NOx. We appreciate you making yourselves available. Ana and I will continue to study the relevant regulations as we get up to speed on this topic that is new to us. We are doing our best to gather knowledge and ensure compliance. As discussed, we will complete the following steps:

1. **Tier 3:** Tesla will receive finalized Tier 3 NMOG + NOx submission template from EPA in the coming days. Tesla will complete using volume from all 50 US states and submit over VERIFY in the existing Tier 2 submission category. Tesla will also send a copy to EPA (David and David) marked as CBI.
  - a. EPA may send a draft template in the interim for Tesla to review. This draft template should not be treated as final.
2. **Tier 2:** Tesla will review relevant regulations and await guidance from EPA on whether Tesla can generate Tier 2 NOx credits and use the AB&T program.
  - a. Tesla will prepare a letter affirming that all of our vehicles are electric and comply with the program.

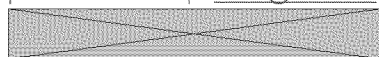
Please let me know if you have any questions or additions to these takeaways.

Best,  
Dan

**Dan Wohl | Associate |** Business Development and Government Affairs

6800 Dumbarton Circle | Fremont, CA USA 94555

p +1 818.434.9971 | e [dwohl@tesla.com](mailto:dwohl@tesla.com)



-----Original Appointment-----

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Sent:** Tuesday, May 1, 2018 7:59 AM

**To:** Good, David; Dan Wohl

**Cc:** Ott, William; Rojeck, Tristin

**Subject:** Discuss NMOG+NOx Fleet Credits

**When:** Tuesday, May 1, 2018 1:00 PM-2:00 PM (UTC-05:00) Eastern Time (US & Canada).

**Where:** AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Dan,

EPA will call you at 10 am PT (1 PM ET) to discuss the following points you raised in your e-mail to EPA on April 23<sup>rd</sup>.



Message

---

**From:** Dan Wohl [dwohl@tesla.com]  
**Sent:** 7/26/2019 8:02:41 PM  
**To:** Good, David [good.david@epa.gov]  
**Subject:** Follow Up

Hi Dave,

**Ex. 4 CBI**

We would appreciate an update on the status of the GHG multiplier. As a regulated party producing only fully battery electric vehicles, the GHG multiplier has a significant impact on our compliance status and the number of credits our fleet generates.

**Ex. 4 CBI**

**Ex. 4 CBI**

Dan

Dan Wohl | Associate, Business Development  
45500 Fremont Blvd., Fremont, CA 94555  
+1 (818) 434-9971 | [dwohl@tesla.com](mailto:dwohl@tesla.com)

**T E S L A**

## Appointment

---

**From:** Ray Wang [raywang@tesla.com]  
**Sent:** 4/17/2020 11:13:12 PM  
**To:** Suraj Nagaraj [snagaraj@tesla.com]; Rojeck, Tristin [rojeck.tristin@epa.gov]  
**CC:** Wehrly, Linc [wehrly.linc@epa.gov]; Ott, William [ott.william@epa.gov]; Vineet Mehta [vineet@tesla.com]; Good, David [good.david@epa.gov]; Wright, DavidA [Wright.DavidA@epa.gov]  
**Subject:** MS LR+ FE label and up-coming program confirmatory test  
**Attachments:** image001.png  
**Location:** Microsoft Teams Meeting  
**Start:** 4/21/2020 6:00:00 PM  
**End:** 4/21/2020 7:00:00 PM  
**Show Time As:** Tentative

**Recurrence:** (none)

Hi Tristin,

Please let me know if this time works for you. Feel free to propose a new time if not.

---

### Join Microsoft Teams Meeting

Learn more about Teams | Meeting options

---

Thank you

Regards,

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Friday, April 17, 2020 2:08 PM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Thanks, Tristin

Glad to note that you are all doing fine. Same at our end . Let's keep it that way ☺ .

Tuesday 4/21 works better for us. Same time 11-12 PST?

Suraj

---

**From:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Sent:** Friday, April 17, 2020 12:33 PM  
**To:** Suraj Nagaraj <snagaraj@tesla.com>; Ray Wang <raywang@tesla.com>  
**Cc:** Wehrly, Linc <wehrly.linc@epa.gov>; Ott, William <ott.william@epa.gov>; Vineet Mehta <vineet@tesla.com>; Good, David <good.david@epa.gov>; Wright, DavidA <Wright.DavidA@epa.gov>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hello Suraj,

As far as I know, thankfully everyone around here is doing alright. I hope the Tesla team is doing well also.

I agree that a meeting early next week would be very beneficial. EPA staff is available Monday 4/20 from 2:00-3:00PM EST (11:00AM-Noon PST) if that works for the Tesla team. Otherwise, the afternoon of the 21<sup>st</sup> looks open as well.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

---

**From:** Suraj Nagaraj <snagaraj@tesla.com>  
**Sent:** Friday, April 17, 2020 2:06 PM  
**To:** Ray Wang <raywang@tesla.com>; Wright, DavidA <Wright.DavidA@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Wehrly, Linc <wehrly.linc@epa.gov>; Ott, William <ott.william@epa.gov>; Vineet Mehta <vineet@tesla.com>; Good, David <good.david@epa.gov>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hello David,

Hope you are all staying safe in these troubled times. Would it be possible to have a quick call early next week with you, Tristin and Dave Good to discuss our product plans for the remainder of this Calendar year?

Ex. 4 CBI

**Ex. 4 CBI**

Thanks again,  
Suraj

---

**From:** Ray Wang <raywang@tesla.com>  
**Sent:** Wednesday, April 15, 2020 10:33 AM  
**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Suraj Nagaraj <snagaraj@tesla.com>; Wehrly, Linc <wehrly.linc@epa.gov>; Ott, William <ott.william@epa.gov>; Vineet Mehta <vineet@tesla.com>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hi David,

Sorry for the late response. We added the answers (page 4-7) into the slides we provided earlier. Please see attached.

## Ex. 4 CBI

the vehicle is available for shipment right after the submission? Will the lab open for testing in early May?

Thank you

Regards,

**Ray Wang** | Engineer, Homologation

901 Page Ave, Fremont, CA 94538

m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)

**T E S L A**

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Sent:** Wednesday, April 8, 2020 2:10 PM

**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>;

Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Ray,

What is the peak regeneration force when in creep or roll and standard braking mode? When did Tesla introduce the option to vary the regeneration braking force as a driver selectable mode for the Model 3, S, X, and Y? Are there differences in the braking force option between vehicle lines, i.e. is the peak regeneration force during standard mode braking the same for the Model 3, S, X, and Y? And, when did Tesla introduce the hold, creep, and roll driver selectable options on the Model 3, S, X, and Y?

Regards,

David

David Wright

Light-Duty Vehicle Center – Compliance Division

Office of Transportation and Air Quality

U.S. Environmental Protection Agency

(734) 214-4467

---

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Sent:** Wednesday, April 08, 2020 4:51 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>;

Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hi David,

The [Ex. 4 CBI] the customer vehicle data. Same situation for the "Model S Regen Fleet Usage". It's data collected from customer vehicles showing which regen mode they use for driving.

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Sent:** Wednesday, April 8, 2020 1:31 PM  
**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Ray,

What is "fleet stopping mode preference" as shown on Slide 4 of your presentation? What is "Model S Regen Fleet Usage" on Slide 5?

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Sent:** Wednesday, April 08, 2020 4:13 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hi David,

Thank you for your thoughts on the one-pedal mode. I'm a little confused with why the data we provided would not be applicable for the LR+ because it's an entirely new model. The data we provided is from the whole Model S/X fleet. LR+ customer selection won't be any different than the entire fleet. It should be able to carry over from the fleet data. Similar case for the regen selection. [Ex. 4 CBI] based on the fleet data. Can you point out the criteria for us?

Regarding the [Ex. 4 CBI] could you help us confirming which section in the CUSD-09-19 letter indicates that? With the fleet stopping mode preference data, it shows the [Ex. 4 CBI] [Ex. 4 CBI] has the dominant take rate of all.

Thank you

Regards,

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**TESLA**

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Sent:** Wednesday, April 8, 2020 11:29 AM

**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>;  
Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Ray,

Having reviewed the material Tesla has provided regarding mode usage it does not appear to EPA that one-pedal mode meets the predominant mode definition in EPA guidance letter CISC-09-19. It is also unclear to EPA that the data provided would be applicable for the Model S LR+ as this is an entirely new model according to Tesla and therefore usage data are not available for this new model.

This also raises additional questions for EPA regarding the range and consumption testing and labeling of other Tesla models as the information on Page 4 of the March 27<sup>th</sup> 2020 Tesla presentation indicates this mode can be found in current Tesla models on the road, and, the data submitted indicate the predominant criteria are not met for this single mode to be used for labeling for these vehicles.

We can further discuss this at your convenience. I expect you will have additional questions. Please do not hesitate to contact me. As I am currently teleworking it would be best to determine a time for a conference call if that would be preferable for Tesla's staff.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Sent:** Wednesday, April 08, 2020 1:53 PM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hi Tristin,

Just following up on this email. Do you have any updates for us?

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

---

**From:** Ray Wang  
**Sent:** Monday, April 6, 2020 10:35 AM  
**To:** Rojeck, Tristin ([rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)) <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Subject:** MS LR+ FE label and up-coming program confirmatory test

Hi Tristin,

For next model year (MY21), we will have Model S and X Ex. 4 CBI Then the Model S LR/LR+ can have more than Ex. 4 CBI tested range. In our understanding, EPA will likely run a confirmatory test on that vehicle again. Because of the current COVID-19 situation, how we operate really is affected. From EPA side, do you have an estimated availability from your testing lab? When the earliest EPA can run the confirmatory test?

By the way, any updates on the Model S Long Range Plus FE label release and the final approval? The LR+ data is not posted on the FE website yet. Do you or David have any follow up questions on the explanations?

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

Message

---

**From:** Rojeck, Tristin [rojeck.tristin@epa.gov]  
**Sent:** 4/21/2020 4:56:13 PM  
**To:** Ray Wang [raywang@tesla.com]; Good, David [good.david@epa.gov]; Wright, DavidA [Wright.DavidA@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]; Ott, William [ott.william@epa.gov]  
**CC:** Vineet Mehta [vineet@tesla.com]; Suraj Nagaraj [snagaraj@tesla.com]  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hello Ray,

Thank you for pointing this out. I know at least some of our staff has used Teams recently. Those who are unfamiliar and plan to attend can reach out to me if they need help.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

---

**From:** Ray Wang <raywang@tesla.com>  
**Sent:** Tuesday, April 21, 2020 12:39 PM  
**To:** Rojeck, Tristin <rojeck.tristin@epa.gov>; Good, David <good.david@epa.gov>; Wright, DavidA <Wright.DavidA@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Ott, William <ott.william@epa.gov>  
**Cc:** Vineet Mehta <vineet@tesla.com>; Suraj Nagaraj <snagaraj@tesla.com>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hello All,

As you may aware, we have switched to **Teams** and not using **Zoom** any more. With Teams, you may not be able to connect with a phone number. Just to point it out in case it causes any trouble for you.

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

-----Original Appointment-----

**From:** Ray Wang  
**Sent:** Friday, April 17, 2020 4:13 PM  
**To:** Ray Wang; Suraj Nagaraj; Rojeck, Tristin  
**Cc:** Wehrly, Linc; Ott, William; Vineet Mehta; Good, David; Wright, DavidA  
**Subject:** MS LR+ FE label and up-coming program confirmatory test  
**When:** Tuesday, April 21, 2020 11:00 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada).  
**Where:** Microsoft Teams Meeting

Updates: please see the agenda for this meeting.



Agenda:

- MY2021 certification preview meeting

# Ex. 4 CBI

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## Join Microsoft Teams Meeting

Learn more about Teams | Meeting options

---

Thank you

Regards,

**Ray Wang** | Engineer, Homologation

901 Page Ave, Fremont, CA 94538

m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)

**T E S L A**

---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Sent:** Friday, April 17, 2020 2:08 PM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

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**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Thanks, Tristin

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Tuesday 4/21 works better for us. Same time 11-12 PST?

Suraj

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**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hello Suraj,

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I agree that a meeting early next week would be very beneficial. EPA staff is available Monday 4/20 from 2:00-3:00PM EST (11:00AM-Noon PST) if that works for the Tesla team. Otherwise, the afternoon of the 21<sup>st</sup> looks open as well.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
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**Sent:** Friday, April 17, 2020 2:06 PM

**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

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**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hello David,

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**Ex. 4 CBI**

**Ex. 4 CBI**

Thanks again,  
Suraj

---

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Sent:** Wednesday, April 15, 2020 10:33 AM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hi David,

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**Ex. 4 CBI**

the vehicle is available for shipment right after the submission? Will the lab open for testing in early May?

Thank you

Regards,

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
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**TESLA**

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Sent:** Wednesday, April 8, 2020 2:10 PM

**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>;  
Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Ray,

What is the peak regeneration force when in creep or roll and standard braking mode? When did Tesla introduce the option to vary the regeneration braking force as a driver selectable mode for the Model 3, S, X, and Y? Are there differences in the braking force option between vehicle lines, i.e. is the peak regeneration force during standard mode braking the same for the Model 3, S, X, and Y? And, when did Tesla introduce the hold, creep, and roll driver selectable options on the Model 3, S, X, and Y?

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Sent:** Wednesday, April 08, 2020 4:51 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>;  
Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hi David,

The Ex. 4 CBI customer vehicle data. Same situation for the "Model S Regen Fleet Usage". It's data collected from customer vehicles showing which regen mode they use for driving.

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Sent:** Wednesday, April 8, 2020 1:31 PM

**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>;

Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Ray,

What is Ex. 4 CBI as shown on Slide 4 of your presentation? What is "Model S Regen Fleet Usage" on Slide 5?

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Sent:** Wednesday, April 08, 2020 4:13 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>;

Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hi David,

Thank you for your thoughts on the one-pedal mode. I'm a little confused with why the data we provided would not be applicable for the LR+ because it's an entirely new model. The data we provided is from the whole Model S/X fleet. LR+ customer selection won't be any different than the entire fleet. It should be able to carry over from the fleet data. Similar case for the regen selection. Ex. 4 CBI based on the fleet data. Can you point out the criteria for us?

Regarding the Ex. 4 CBI could you help us confirming which section in the CISD-09-19 letter indicates that? With the fleet stopping mode preference data, it shows the Ex. 4 CBI Ex. 4 CBI has the dominant take rate of all.

Thank you

Regards,

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
TESLA

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**From:** Wright, DavidA <Wright.DavidA@epa.gov>  
**Sent:** Wednesday, April 8, 2020 11:29 AM  
**To:** Ray Wang <raywang@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Suraj Nagaraj <snagaraj@tesla.com>; Wehrly, Linc <wehrly.linc@epa.gov>; Ott, William <ott.william@epa.gov>; Vineet Mehta <vineet@tesla.com>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Ray,

Having reviewed the material Tesla has provided regarding mode usage it does not appear to EPA that one-pedal mode meets the predominant mode definition in EPA guidance letter CISC-09-19. It is also unclear to EPA that the data provided would be applicable for the Model S LR+ as this is an entirely new model according to Tesla and therefore usage data are not available for this new model.

This also raises additional questions for EPA regarding the range and consumption testing and labeling of other Tesla models as the information on Page 4 of the March 27<sup>th</sup> 2020 Tesla presentation indicates this mode can be found in current Tesla models on the road, and, the data submitted indicate the predominant criteria are not met for this single mode to be used for labeling for these vehicles.

We can further discuss this at your convenience. I expect you will have additional questions. Please do not hesitate to contact me. As I am currently teleworking it would be best to determine a time for a conference call if that would be preferable for Tesla's staff.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Ray Wang <raywang@tesla.com>  
**Sent:** Wednesday, April 08, 2020 1:53 PM  
**To:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Suraj Nagaraj <snagaraj@tesla.com>; Wright, DavidA <Wright.DavidA@epa.gov>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hi Tristin,

Just following up on this email. Do you have any updates for us?

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538

m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)

**TESLA**

---

**From:** Ray Wang

**Sent:** Monday, April 6, 2020 10:35 AM

**To:** Rojeck, Tristin ([rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)) <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Subject:** MS LR+ FE label and up-coming program confirmatory test

Hi Tristin,

For next model year (MY21), we will have Model S and X **Ex. 4 CBI** Then the Model S LR/LR+ can have more than **Ex. 4 CBI** tested range. In our understanding, EPA will likely run a confirmatory test on that vehicle again. Because of the current COVID-19 situation, how we operate really is affected. From EPA side, do you have an estimated availability from your testing lab? When the earliest EPA can run the confirmatory test?

By the way, any updates on the Model S Long Range Plus FE label release and the final approval? The LR+ data is not posted on the FE website yet. Do you or David have any follow up questions on the explanations?

Thank you

**Ray Wang** | Engineer, Homologation

901 Page Ave, Fremont, CA 94538

m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)

**TESLA**

**To:** Wright, DavidA[Wright.DavidA@epa.gov]; Vineet Mehta[vineet@tesla.com]; Kannan Govindasamy[kgovindasamy@tesla.com]; Rojeck, Tristin[rojeck.tristin@epa.gov]  
**Cc:** Ott, William[ott.william@epa.gov]; Good, David[good.david@epa.gov]; Suraj Nagaraj[snagaraj@tesla.com]  
**From:** Kyle Strohmaier[kstrohmaier@tesla.com]  
**Sent:** Tue 6/26/2018 10:15:40 PM (UTC)  
**Subject:** RE: EPA review of Model 3 AWD/Performance  
20180626 epaMeeting.pptx

Hi David,

Per your request, I've attached to this email the brief slide deck I showed this afternoon.

Thanks again for hosting the meeting today, and let me know if there are any other clarifying questions you have.

Regards,

Kyle

---

**From:** Wright, DavidA [mailto:Wright.DavidA@epa.gov]  
**Sent:** Monday, June 25, 2018 3:44 PM  
**To:** Kyle Strohmaier <kstrohmaier@tesla.com>; Vineet Mehta <vineet@tesla.com>; Kannan Govindasamy <kgovindasamy@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Ott, William <ott.william@epa.gov>; Good, David <good.david@epa.gov>; Suraj Nagaraj <snagaraj@tesla.com>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Kyle,

You should have received a meeting invitation for tomorrow afternoon at 3 pm eastern time.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Kyle Strohmaier [mailto:kstrohmaier@tesla.com]  
**Sent:** Monday, June 25, 2018 1:59 PM  
**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Vineet Mehta <vineet@tesla.com>; Kannan Govindasamy <kgovindasamy@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Ott, William <ott.william@epa.gov>; Good, David <good.david@epa.gov>; Suraj Nagaraj <snagaraj@tesla.com>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Hi David,

I could stop by early tomorrow afternoon. Does that time work for you? If a different time works better, let me know, and I can likely accommodate.

Thank you,

Kyle

---

**From:** Wright, DavidA [mailto:Wright.DavidA@epa.gov]  
**Sent:** Monday, June 25, 2018 12:43 PM

**To:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>; Rojeck, Tristin

<[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Subject:** RE: EPA review of Model 3 AWD/Performance

Vineet,

Let us know when you would like to have Kyle stop by – the point I wanted to make is that the range values are not the same and that the data for the 5-cycle derating factor are not applicable to the Model 3.

Regards,  
David

---

**From:** Vineet Mehta [<mailto:vineet@tesla.com>]

**Sent:** Thursday, June 21, 2018 8:24 PM

**To:** Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Subject:** Re: EPA review of Model 3 AWD/Performance

Hi David,

Upon further thought, we would rather address your concerns in person. Kyle Strohmaier happens to be in the area over the next few days. Based on a time that is mutually convenient, he can visit you in person to discuss.

Also, one correction to your statement below, the true difference in range between E3 RWD and E3 AWD is NOT 35 miles, but close to 20 miles based on the data we have submitted.

Thanks  
Vineet

---

**From:** Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>

**Date:** Thursday, June 21, 2018 at 12:51 PM

**To:** DavidA Wright <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>, "Rojeck, Tristin" <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** William Ott <[ott.william@epa.gov](mailto:ott.william@epa.gov)>, Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>, David Good <[good.david@epa.gov](mailto:good.david@epa.gov)>, Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>, Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Subject:** RE: EPA review of Model 3 AWD/Performance

David – We feel if we could discuss this over a phone call for better understanding and let us know if you have time (30 mins) today or tomorrow. Thanks

Kannan

---

**From:** Wright, DavidA [<mailto:Wright.DavidA@epa.gov>]

**Sent:** Thursday, June 21, 2018 10:59 AM

**To:** Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>

**Subject:** RE: EPA review of Model 3 AWD/Performance

Kannan,

At this time it is our thought that the label range value for the LR AWD Model 3 needs to be voluntarily lowered in the same manner as was performed for the LR RWD Model 3. As noted in the EPA regulations “Manufacturers may voluntarily lower fuel economy values and raise CO2 values if they determine that the label values are not representative.” As these values are provided on the label to inform consumers of the relative performance of the different vehicles, and, as the test data generated by Tesla show the range of the AWD is around 35 miles less than the RWD model it is appropriate for these differences to be reflected in the label range value. To label the vehicles with the same range value when the MPGe is not the same and the battery capacity is the

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same (which will be publicly available information at the time of introduction to commerce) does not make sense, nor is it consistent with the test data Tesla has submitted.

The same issue exists with Tesla deciding to use a 5-cycle derating factor from you other products for the LR AWD Model 3, while choosing to use the 0.7 derating factor specified in EPA regulations for the LR RWD Model 3. EPA does not think that this derating factor is applicable to the Model 3 as the electrical motors and inverters are not the same as those used to generate the derating factor. It is our belief that Tesla needs to generate a derating factor for the Model 3 AWD system if Tesla decides to use a 5-cycle method for generating the derating factor, otherwise the 0.7 factor needs to be applied.

Let me know if you have any questions regarding the information provided in this note.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Kannan Govindasamy [<mailto:kgovindasamy@tesla.com>]  
**Sent:** Wednesday, June 20, 2018 6:11 PM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Hello Tristin,

For LR RWD, we did use the default derating factor (0.7), due to time constraints we did not go through 5-cycle testing and only used MCT.

For LR AWD, we did use the custom derating factor (0.7032) as agreed with EPA before for S & X. This is basically derived from Ratio of five cycle /two cycle combined FE value (mi / kwh-dc) as shown in the attachment. We are not voluntarily reducing the range and reported as is for AWD.

I can correct the Test lab information in next round. I will go ahead submit the rest of the VERIFY information for issuing the certificate. Thanks

**Kannan Govindasamy** | Vehicle Homologation | desk 510.249.3755 | Tesla Inc. 901 Page Ave, Fremont CA 94538

Derating factor = Five cycle combined FE (3.91) / Two cycle combined FE (5.555) = 0.7032

---

**From:** Rojeck, Tristin [<mailto:rojeck.tristin@epa.gov>]  
**Sent:** Wednesday, June 20, 2018 2:11 PM  
**To:** Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>  
**Cc:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Hello Kannan,

Thank you for the response and additional information. The explanation of the MCT Range difference makes much more sense now.

Where is the "Derating Factor" of 0.7032 derived from? In the initial submission of the LR RWD version, the generally applicable 0.7

was used as the derating factor per 40CFR 600.210-12. Also, we’re internally wondering if Tesla is considering voluntarily lowering the label range consistent with the prior LR RWD version especially because they have different MPGe label values.

Additionally, a minor error in the certification application was found for test group JTSLV00.0L23. The Lab for the test data in the MCT calculator (page 18) is stated as “NVFEL” rather than Tesla’s Lab. Please update this when you get a chance to avoid confusion later.

Regards,  
Tristin Rojeck

Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

**From:** Kannan Govindasamy [<mailto:kgovindasamy@tesla.com>]  
**Sent:** Tuesday, June 19, 2018 5:16 PM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Hello Tristin,

The AWD MCT range is larger simply due to a different cruising speed having been used for the CSC sections, which make up the majority of the distance travelled during the MCT test.

We used 65 MPH for CSC during the RWD test, due to testing time constraints, and EPA ran the confirmatory test using 65 MPH. In preparation for the AWD testing, we reviewed the test sequence and found that 55 MPH is allowed per current SAE standard (J1634 2012) version, per CFR Section (600.116-12 and 600.001 “Incorporation by reference”).

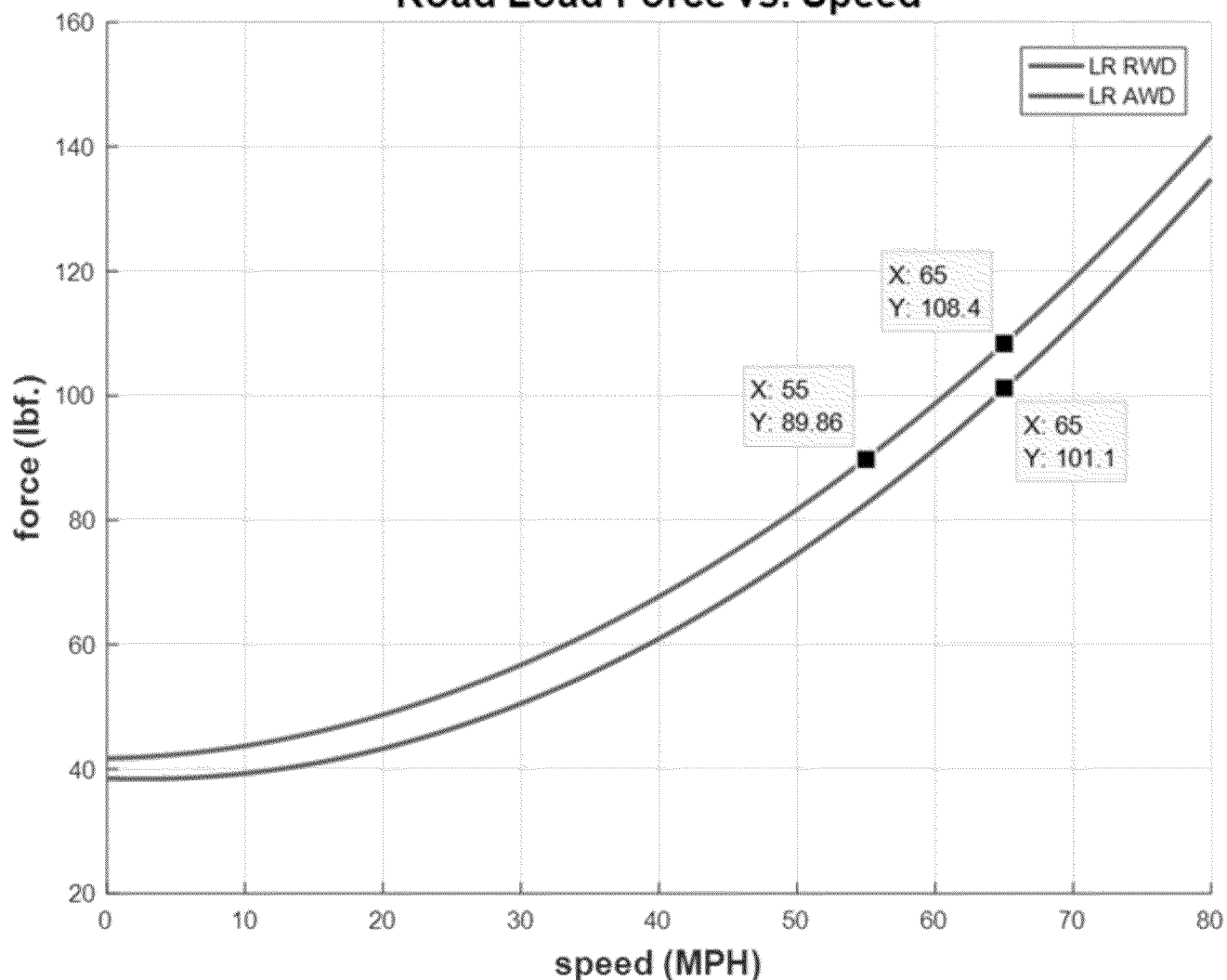
The road load curves we have submitted show that there could be no physical explanation for the AWD car being more efficient than RWD at a given cruising speed. This is consistent with the results submitted for the HWY and UDDS cycles. Torque split optimization cannot close the gap in road load, because the PM machine is shared by both variants and is more efficient than the front IM in the AWD variant. See Road Load Force comparison below at different CSC speed.

Please let us know if you have questions and let me know if I can submit the rest of the VERIFY sections to request the certificate.  
Thanks

**Kannan Govindasamy** | Vehicle Homologation | desk 510.249.3755 | Tesla Inc. 901 Page Ave, Fremont CA 94538

RWD RLF @ 65 MPH	AWD RLF @ 65 MPH	AWD RLF @ 55 MPH
+0% [baseline]	+7.2%	-11.1%

## Road Load Force vs. Speed



**From:** Rojeck, Tristin [<mailto:rojeck.tristin@epa.gov>]

**Sent:** Tuesday, June 19, 2018 10:46 AM

**To:** Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Cc:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>

**Subject:** EPA review of Model 3 AWD/Performance

Hello Kannan and Suraj,

After reviewing Tesla's confirmatory test and decision information and the application for test group JTSLV00.0L23, a few questions arose based on the comparison of this LR AWD version of the Model 3 compared to the initial LR RWD option. Attached is a spreadsheet that uses calculations from SAE J1634 for MCT data analysis to compare the results of the two Model 3 variations per the values given in the certification applications. It came to our attention that the MCT range for the LR RWD option was 371.47 miles and the MCT range for the LR AWD option was 420.4 miles, while the charge depleting tests showed a decreased range and decreased MPGe values for both the HWY and UDDS cycles for the LR AWD option.

It is understood that some optimization will occur based on the dual motor operation at higher speeds, but there is a drastic difference between the RWD and AWD variations that may not be clearly represented on the charge depleting HWY test. Values highlighted in yellow on the appended spreadsheet are of particular interest. An explanation for the differences would be appreciated and would aid the review process.

Best Regards,

Tristin Rojeck

Light-Duty Vehicle Center – Compliance Division

ED\_006488\_00001248-00005



Message

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**From:** Joseph Mendelson [jmendelson@tesla.com]  
**Sent:** 9/2/2020 10:07:17 PM  
**To:** McDonald, Joseph [McDonald.Joseph@epa.gov]; Parsons, Christy [Parsons.Christy@epa.gov]; Sanchez, James [sanchez.james@epa.gov]; Healy, Stephen [healy.stephen@epa.gov]  
**CC:** Schaefer, Ron [schaefer.ron@epa.gov]; Ramig, Christopher [Ramig.Christopher@epa.gov]; Nelson, Brian [nelson.brian@epa.gov]; Brakora, Jessica [Brakora.Jessica@epa.gov]; Sobel, Aaron [Sobel.Aaron@epa.gov]; Daniels, Jessica [daniels.jessica@epa.gov]; Ana Stewart [astewart@tesla.com]; Andrew Schwartz [anschwartz@tesla.com]; Fei Chi [fchi@tesla.com]; Zach Kahn [zkahn@tesla.com]  
**Subject:** RE: CTI Discussion with Tesla

Thanks, Joe

**Joseph Mendelson** | Senior Counsel | Public Policy and Business Development

1333 H Street, NW, 11<sup>th</sup> Floor West | Washington, DC 20005

c 703.244.1724 | e [jmendelson@tesla.com](mailto:jmendelson@tesla.com)



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Please consider the environment before printing this email.

---

**From:** McDonald, Joseph <McDonald.Joseph@epa.gov>  
**Sent:** Wednesday, September 2, 2020 6:03 PM  
**To:** Joseph Mendelson <jmendelson@tesla.com>; Parsons, Christy <Parsons.Christy@epa.gov>; Sanchez, James <sanchez.james@epa.gov>; Healy, Stephen <healy.stephen@epa.gov>  
**Cc:** Schaefer, Ron <schaefer.ron@epa.gov>; Ramig, Christopher <Ramig.Christopher@epa.gov>; Nelson, Brian <nelson.brian@epa.gov>; Brakora, Jessica <Brakora.Jessica@epa.gov>; Sobel, Aaron <Sobel.Aaron@epa.gov>; Daniels, Jessica <daniels.jessica@epa.gov>; Ana Stewart <astewart@tesla.com>; Andrew Schwartz <anschwartz@tesla.com>; Fei Chi <fchi@tesla.com>; Zach Kahn <zkahn@tesla.com>  
**Subject:** RE: CTI Discussion with Tesla

Joe,

I will work with our engineering staff to put together a list of technical questions and follow up with topics for an upcoming meeting.

Best regards,

Joe

Joseph McDonald  
Senior Engineer

U.S. EPA  
OAR/OTAQ/ASD  
Mail Stop: 236

26 W. Martin Luther King Dr.  
Cincinnati, Ohio 45268 USA

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Cellular Telephone: 513-316-2380  
E-mail: [mcdonald.joseph@epa.gov](mailto:mcdonald.joseph@epa.gov)

---

**From:** Joseph Mendelson <[jmendelson@tesla.com](mailto:jmendelson@tesla.com)>  
**Sent:** Wednesday, September 2, 2020 5:56 PM  
**To:** Parsons, Christy <[Parsons.Christy@epa.gov](mailto:Parsons.Christy@epa.gov)>; Sanchez, James <[sanchez.james@epa.gov](mailto:sanchez.james@epa.gov)>; Healy, Stephen <[healy.stephen@epa.gov](mailto:healy.stephen@epa.gov)>  
**Cc:** Schaefer, Ron <[schaefer.ron@epa.gov](mailto:schaefer.ron@epa.gov)>; McDonald, Joseph <[McDonald.Joseph@epa.gov](mailto:McDonald.Joseph@epa.gov)>; Ramig, Christopher <[Ramig.Christopher@epa.gov](mailto:Ramig.Christopher@epa.gov)>; Nelson, Brian <[nelson.brian@epa.gov](mailto:nelson.brian@epa.gov)>; Brakora, Jessica <[Brakora.Jessica@epa.gov](mailto:Brakora.Jessica@epa.gov)>; Sobel, Aaron <[Sobel.Aaron@epa.gov](mailto:Sobel.Aaron@epa.gov)>; Daniels, Jessica <[daniels.jessica@epa.gov](mailto:daniels.jessica@epa.gov)>; Ana Stewart <[astewart@tesla.com](mailto:astewart@tesla.com)>; Andrew Schwartz <[anschwartz@tesla.com](mailto:anschwartz@tesla.com)>; Fei Chi <[fchi@tesla.com](mailto:fchi@tesla.com)>; Zach Kahn <[zkahn@tesla.com](mailto:zkahn@tesla.com)>  
**Subject:** RE: CTI Discussion with Tesla

Sounds good, Christy.

What might be helpful for next steps is for your team to put together a list of technical questions or topics that you like to discuss. It would allow us make sure we get the right people from our side on a call.

Let me know if this could work. We will start rounding up technical folks on our side and then we can work together to find a time for the discussion.

Thanks,  
Joe

**Joseph Mendelson** | Senior Counsel | Public Policy and Business Development

1333 H Street, NW, 11<sup>th</sup> Floor West | Washington, DC 20005

c 703.244.1724 | e [jmendelson@tesla.com](mailto:jmendelson@tesla.com)

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**From:** Parsons, Christy <[Parsons.Christy@epa.gov](mailto:Parsons.Christy@epa.gov)>  
**Sent:** Wednesday, September 2, 2020 9:29 AM  
**To:** Joseph Mendelson <[jmendelson@tesla.com](mailto:jmendelson@tesla.com)>; Sanchez, James <[sanchez.james@epa.gov](mailto:sanchez.james@epa.gov)>; Healy, Stephen <[healy.stephen@epa.gov](mailto:healy.stephen@epa.gov)>  
**Cc:** Schaefer, Ron <[schaefer.ron@epa.gov](mailto:schaefer.ron@epa.gov)>; McDonald, Joseph <[McDonald.Joseph@epa.gov](mailto:McDonald.Joseph@epa.gov)>; Ramig, Christopher <[Ramig.Christopher@epa.gov](mailto:Ramig.Christopher@epa.gov)>; Nelson, Brian <[nelson.brian@epa.gov](mailto:nelson.brian@epa.gov)>; Brakora, Jessica <[Brakora.Jessica@epa.gov](mailto:Brakora.Jessica@epa.gov)>; Sobel, Aaron <[Sobel.Aaron@epa.gov](mailto:Sobel.Aaron@epa.gov)>; Daniels, Jessica <[daniels.jessica@epa.gov](mailto:daniels.jessica@epa.gov)>; Ana Stewart <[astewart@tesla.com](mailto:astewart@tesla.com)>; Andrew Schwartz <[anschwartz@tesla.com](mailto:anschwartz@tesla.com)>; Fei Chi <[fchi@tesla.com](mailto:fchi@tesla.com)>; Zach Kahn <[zkahn@tesla.com](mailto:zkahn@tesla.com)>  
**Subject:** RE: CTI Discussion with Tesla

Joe,

Thanks very much to you, Andy, Zach, and Fei for your time yesterday morning. We appreciate you reaching out to share your perspectives on heavy-duty ZEV emission credits as we continue our work on the proposed CTI rulemaking.

As discussed, we would welcome any additional perspectives you might want to share related to: ZEV performance criteria and test methods for establishing credit values; mileage and year ranges for potential ZEV warranty requirements; data projecting HD ZEV market penetration rates.

We would also be interested in following up with your technical team to better understand topics related to the heavy-duty ZEV technology you're developing (e.g., braking in a mountainous terrain, battery architecture). Joe McDonald, who's included here, can be a point of contact to help arrange a follow-up conversation if your technical team is willing to do so.

If other topics would be useful to follow-up on in the future, then please don't hesitate to reach back out to me.

Thank you,  
Christy

Christy Parsons, PhD  
Physical Scientist  
Assessment and Standards Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
Ann Arbor, MI  
Tel: 734.214.4243  
E-mail: [parsons.christy@epa.gov](mailto:parsons.christy@epa.gov)

---

**From:** Joseph Mendelson <[jmendelson@tesla.com](mailto:jmendelson@tesla.com)>  
**Sent:** Tuesday, September 1, 2020 5:21 PM  
**To:** Parsons, Christy <[Parsons.Christy@epa.gov](mailto:Parsons.Christy@epa.gov)>; Sanchez, James <[sanchez.james@epa.gov](mailto:sanchez.james@epa.gov)>; Healy, Stephen <[healy.stephen@epa.gov](mailto:healy.stephen@epa.gov)>  
**Cc:** Schaefer, Ron <[schaefer.ron@epa.gov](mailto:schaefer.ron@epa.gov)>; McDonald, Joseph <[McDonald.Joseph@epa.gov](mailto:McDonald.Joseph@epa.gov)>; Ramig, Christopher <[Ramig.Christopher@epa.gov](mailto:Ramig.Christopher@epa.gov)>; Nelson, Brian <[nelson.brian@epa.gov](mailto:nelson.brian@epa.gov)>; Brakora, Jessica <[Brakora.Jessica@epa.gov](mailto:Brakora.Jessica@epa.gov)>; Sobel, Aaron <[Sobel.Aaron@epa.gov](mailto:Sobel.Aaron@epa.gov)>; Daniels, Jessica <[daniels.jessica@epa.gov](mailto:daniels.jessica@epa.gov)>; Ana Stewart <[astewart@tesla.com](mailto:astewart@tesla.com)>; Andrew Schwartz <[anschwartz@tesla.com](mailto:anschwartz@tesla.com)>; Fei Chi <[fchi@tesla.com](mailto:fchi@tesla.com)>; Zach Kahn <[zkahn@tesla.com](mailto:zkahn@tesla.com)>  
**Subject:** RE: CTI Discussion with Tesla

Christy and Team,

Thanks again for organizing the call this morning. We really appreciated the discussion and the ability to provide some additional Tesla perspectives post-CARB HD Omnibus rule process.

We look forward to further discussions and providing technical perspective as needed.

My best,  
Joe

**Joseph Mendelson** | Senior Counsel | Public Policy and Business Development  
1333 H Street, NW, 11<sup>th</sup> Floor West | Washington, DC 20005  
c 703.244.1724 | e [jmendelson@tesla.com](mailto:jmendelson@tesla.com)

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-----Original Appointment-----

**From:** Parsons, Christy <[Parsons.Christy@epa.gov](mailto:Parsons.Christy@epa.gov)>

**Sent:** Wednesday, August 19, 2020 9:59 AM

**To:** Parsons, Christy; Sanchez, James; Healy, Stephen; Joseph Mendelson

**Cc:** Schaefer, Ron; McDonald, Joseph; Ramig, Christopher; Nelson, Brian; Brakora, Jessica; Sobel, Aaron; Daniels, Jessica; Ana Stewart

**Subject:** CTI Discussion with Tesla

**When:** Tuesday, September 1, 2020 11:00 AM-12:00 PM (UTC-05:00) Eastern Time (US & Canada).

**Where:** Microsoft Teams Meeting

Adding an agenda and Tesla's comments on the CARB HD Omnibus proposal for reference; look forward to talking with everyone on Tuesday.

Best,  
Christy

#### Agenda

1. Introductions
2. An update on the EPA's timeline and process
3. An update from Tesla on issues that came up in CA Low NOx rule
  - a. Role of ZEVs in the federal rule and average, banking & trading
4. Q&A

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**To:** Subhan Nadeem[snadeem@tesla.com]  
**From:** Imports[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1CA99411826B441BB77B79F78E7B0C86-IMPORTS]  
**Sent:** Tue 12/1/2020 8:17:04 PM (UTC)  
**Subject:** RE: Regarding EPA requirements when importing a vehicle from Canada to the United States

No label is required if you have a letter from the manufacturer stating the vehicle is compliant.

David C. Hurlin  
EPA Imports Line, Exemptions  
Managed by Jacobs, Contractor to the U.S. EPA  
Phone: (734) 214-4098 or 4100  
Fax: (734) 214-4676

---

**From:** Subhan Nadeem <snadeem@tesla.com>  
**Sent:** Tuesday, December 01, 2020 3:15 PM  
**To:** Imports <Imports@epa.gov>  
**Subject:** Re: Regarding EPA requirements when importing a vehicle from Canada to the United States

Hi,

Thank you for the reply. Just to be clear: if I have a manufacturer letter of compliance in regards to EPA and DOT requirements, I do not need an emissions label on my vehicle?

Thanks,

Subhan Nadeem

---

**From:** Imports <Imports@epa.gov>  
**Date:** Tuesday, December 1, 2020 at 3:06 PM  
**To:** Subhan Nadeem <snadeem@tesla.com>  
**Subject:** RE: Regarding EPA requirements when importing a vehicle from Canada to the United States

Subhan Nadeem,

Thank you for your inquiry. Please follow the instructions below for importing a Canadian vehicle (vehicle originally manufactured for and sold in Canada).

1. Contact the Manufacturer for a letter of compliance that states the vehicle complies with all U.S. Federal EPA and DOT requirements. A list of U.S. Representatives can be found at <http://www2.epa.gov/importing-vehicles-and-engines/light-duty-vehicle-and-motorcycle-manufacturers-us-representatives>
2. Obtain the EPA form 3520-1 from <http://www2.epa.gov/importing-vehicles-and-engines/publications-and-forms-importing-vehicles-and-engines>
3. Contact the DOT at 202-366-5291 or [www.nhtsa.dot.gov/cars/rules/import/](http://www.nhtsa.dot.gov/cars/rules/import/) for the HS-7 form and DOT import regulations.
4. Once you have the letter from the manufacturer, the EPA form and the DOT form, you will need to present all three documents and the vehicle to Customs for a Customs release form which will allow you to title and register your vehicle in the U.S.

- If the manufacturer states that the vehicle is not compliant with the U.S. Federal emission standards and there is not a retrofit available, you will need to contact an Independent Commercial Importer (ICI) to have the vehicle modified, tested, and certified.
- If the manufacturer does not issue a compliance letter, you may not be able to import the vehicle. A copy of the compliance letter from the manufacturer is also required by Customs and DOT. Under EPA regulations if the vehicle has a U.S. emission label then EPA would consider the vehicle to be identical. However, this may not satisfy U.S. Customs.

David C. Hurlin  
EPA Imports Line, Exemptions  
Managed by Jacobs, Contractor to the U.S. EPA  
Phone: (734) 214-4098 or 4100  
Fax: (734) 214-4676

---

**From:** Subhan Nadeem <[snadeem@tesla.com](mailto:snadeem@tesla.com)>  
**Sent:** Tuesday, December 01, 2020 2:53 PM  
**To:** Imports <[Imports@epa.gov](mailto:Imports@epa.gov)>  
**Subject:** Regarding EPA requirements when importing a vehicle from Canada to the United States

Hi,

I am looking to import my 2005 Ford Mustang GT (Canadian vehicle) from Canada to the United States. I am trying to understand the EPA requirements in order to get this done. In particular, my vehicle does not have an emissions label under the hood of the car displaying it's engine family name. However, I do have a letter from the manufacturer of the car, Ford Motor Company, that states the car is compliant with EPA standards and guidelines. Is this letter sufficient for satisfying the EPA import rules, or do I also need an emissions label on my vehicle?

Thanks,

Subhan Nadeem

**To:** Rojeck, Tristin[rojeck.tristin@epa.gov]  
**From:** Ray Wang[raywang@tesla.com]  
**Sent:** Thur 2/13/2020 8:38:18 PM (UTC)  
**Subject:** RE: Model S/X Long Range Plus running change submitted

Hi Tristin,

Regarding the calculator questions you mentioned in our phone call, I just found the root cause of the error. For MS Long Range Plus 5 cycle calculator, I accidentally copied the MX LR+ 2 cycle FC data into the MS LR+ calculator. And by coincidence, the de-rating factor end up with higher value and range was not changed. Basically we can see this as the range is actually affected, it is just end up with the same value.

See the screen shots below, the left one is from the in-correct calculator and right one is from the corrected one I sent you later. The green, yellow and red colored values are the inputs from MX LR+. Green being not affect final number, yellow affects MPGe and red affects range. If you play with the red item values, you can see how the de-rating factor and range change. Hopefully this can help you understand why the range kept the same when derating factor was changed.

Let me know if you have any questions.

City Distance [miles]	552.03	City Distance [miles]	552.03
City Net Energy [kWh-dc]	99.61	City Net Energy [kWh-dc]	99.61
CityFE (mi/kWh-dc)	5.542	CityFE (mi/kWh-dc)	5.542
City DC Whpm	192.33	City DC Whpm	180.45
City AC Wall Energy [kWh]	112.71	City AC Wall Energy [kWh]	113.06
City AC whpm	204.17	City AC whpm	204.80
Hwy Distance [miles]	476.45	Hwy Distance [miles]	517.77
Hwy Net Energy [kWh-dc]	98.64	Hwy Net Energy [kWh-dc]	99.61
HwyFE (mi/kWh-dc)	4.830	HwyFE (mi/kWh-dc)	5.198
Hwy DC Whpm	207.04	Hwy DC Whpm	192.39
Hwy AC Wall Energy [kWh]	112.71	Hwy AC Wall Energy [kWh]	113.06
Hwy AC whpm	236.56	Hwy AC whpm	218.35
CombinedFE (mi/kWh-dc)	5.197	CombinedFE (mi/kWh-dc)	5.382
CombinedFC (dc wh/mi)	198.95	CombinedFC (dc wh/mi)	185.82
Combined AC wh/mi	218.75	Combined AC wh/mi	210.90
Derating Factor	0.7758	Derating Factor	0.7492
Sticker Range	402	Sticker Range	402
Sticker MPGe	120	Sticker MPGe	120

Thank you

Ray Wang | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | raywang@tesla.com  
**TESLA**

**From:** Ray Wang  
**Sent:** Wednesday, February 12, 2020 4:50 PM  
**To:** Rojeck, Tristin (rojeck.tristin@epa.gov) <rojeck.tristin@epa.gov>  
**Cc:** Suraj Nagaraj <snagaraj@tesla.com>  
**Subject:** RE: Model S/X Long Range Plus running change submitted

Hi Tristin,

I just found an error in the 5 cycle calculator for Model S LR+. The de-rating factor should be **0.7492** instead of the **0.7758**. There were some typos in the calculator. I believe this can explain the high de-rating factor. The range will keep the same value as 402 miles. This error won't affect the data submitted to the EV-CIS system.

Please see attached for the corrected calculator and the product roadmap.

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

---

**From:** Ray Wang  
**Sent:** Wednesday, February 12, 2020 1:18 PM  
**To:** 'Rojeck, Tristin ([rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov))' <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Subject:** RE: Model S/X Long Range Plus running change submitted

Hi Tristin,

Please see attached for the updated product roadmap with derating factor and range. It's uploaded to EV-CIS as well. The MCT and 5 cycle calculators are also attached. Hopefully they can ease the decision making.

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

---

**From:** Ray Wang  
**Sent:** Wednesday, February 12, 2020 11:20 AM  
**To:** Rojeck, Tristin ([rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)) <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Subject:** Model S/X Long Range Plus running change submitted

Hi Tristin,

The test data is just submitted to EV-CIS along with the decision information for the test vehicles SD220-364368 and XD220-234408. As we discussed, can we have a quick feedback if you would like to run the confirmatory test on those 2 cars? Our testing team is trying to reuse them for some following tests.

Feel free to call me if you have any questions.

Thank you

Regards,  
**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

Message

---

**From:** Vineet Mehta [vineet@tesla.com]  
**Sent:** 3/3/2021 5:21:57 AM  
**To:** Wright, DavidA [Wright.DavidA@epa.gov]; Rojeck, Tristin [rojeck.tristin@epa.gov]; Kyle Strohmaier [kstrohmaier@tesla.com]  
**CC:** Ray Wang [raywang@tesla.com]; Suraj Nagaraj [snagaraj@tesla.com]; Wehrly, Linc [wehrly.linc@epa.gov]; Christopher Tacub [ctacub@tesla.com]; McBryde, Dan [mcbryde.dan@epa.gov]; George, Steve [george.steve@epa.gov]; Tom Martins [tmartins@tesla.com]  
**Subject:** Re: EPA Confirmatory Retest Criteria

Thanks David.

See my responses in line below...

---

**From:** Wright, DavidA <Wright.DavidA@epa.gov>  
**Date:** Tuesday, March 2, 2021 at 1:51 PM  
**To:** Vineet Mehta <vineet@tesla.com>, Rojeck, Tristin <rojeck.tristin@epa.gov>, Kyle Strohmaier <kstrohmaier@tesla.com>  
**Cc:** Ray Wang <raywang@tesla.com>, Suraj Nagaraj <snagaraj@tesla.com>, Wehrly, Linc <wehrly.linc@epa.gov>, Christopher Tacub <ctacub@tesla.com>, McBryde, Dan <mcbryde.dan@epa.gov>, George, Steve <george.steve@epa.gov>  
**Subject:** RE: EPA Confirmatory Retest Criteria

Vineet,

# Ex. 4 CBI

confirmatory testing process.

We agree with you that it might be good to meet and discuss the initial set of questions EPA has raised regarding the 12 volt battery replacement and Tristin will be sending out an e-mail invitation to you for a meeting to take place tomorrow.

When a component on a vehicle fails during a test on a fuel economy or emission data vehicle, and, that component failure results in the test being unable to be completed the test is normally ended at that point. In the case of the current test, it is my understanding EPA staff contacted Tesla and a troubleshooting process was begun which lead the EPA staff person to perform unscheduled maintenance on the test vehicle, i.e. the failed 12 volt battery was replaced with a spare 12 volt battery which happened to be shipped with the vehicle.

It is my thought that instead of performing the unscheduled maintenance and continuing with the confirmatory test, the test should in fact have ended at that time without proceeding with the re-charge.

The test results which are being generated are not from the as-received vehicle which completed the J1634 test procedure; instead, the result is from a vehicle with a failure that resulted in the test being unable to be completed. The vehicle could not have been recharged with the as-received components and a replacement 12 volt battery with an undetermined SoC was installed to initiate the re-charge process.

As the failure occurred during the confirmatory testing of the vehicle the Agency is seeking information to understand the cause of the failure. In addition, we need to understand what if any differences there would be in re-charge energy

as the 12 volt battery was replaced with a replacement that has some higher level of SoC than the battery it replaced and as such would result in an unmeasured amount of electricity being installed in the vehicle. While I expect this replacement to be minor, it is a source of unaccounted for energy which was been installed on the vehicle and which resulted in the vehicle being capable of returning to operation.

Ex. 4 CBI

**Ex. 4 CBI**

Ex. 4 CBI

I apologize for the inconvenience.

The Agency also has questions about the strategy used by Tesla for maintaining the 12 volt battery SoC as it would not be unexpected for a Model S to be driven over a significant distance to the point of battery depletion as is done on the MCT and the Agency would expect that the vehicle would not be depleted to the point that the 12 volt battery would fail as part of a depletion event. As such, we are interested in understanding why the 12 volt battery was depleted to the point of failure while performing charge depletion testing on a vehicle with less than 4,000 miles.

**Ex. 4 CBI**

The Agency is interested in understanding if there are any differences between the strategy used for the depletion testing on the MCT versus the strategy which is used when a vehicle reaches depletion during customer use. There is

**Ex. 4 CBI**

Let me know if you have any additional questions regarding our requests and I look forward to our conversation tomorrow. Feel free to provide an e-mail with the responses to the questions which Tristin and I have already provided. Yes, I am also including answers to Tristin's questions related to 12V...

1. Is the 12V battery fully charged at the beginning of the test when the propulsion battery is fully charged? 12V

Ex. 4 CBI

2. Is the 12V battery discharge measured during the charge depleting testing?

Ex. 4 CBI

Ex. 4 CBI

3. Is the 12V depletion on-cycle consistent with the 12V depletion expected during a customer's drive?

Ex. 4 CBI

4. What is the capacity of the 12V battery in watt-hours?

Ex. 4 CBI

5. Does Tesla have control logic based on driving or SOC conditions that will impact 12V battery charging?

Ex. 4 CBI

6. Is the fully discharged 12V battery compromised or is it useable after recharge?

Ex. 4 CBI

Ex. 4 CBI

7. Please explain why the HV battery pack does not accept a charge while the 12V battery is dead.

Ex. 4 CBI

Ex. 4 CBI

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency

---

**From:** Vineet Mehta <vineet@tesla.com>  
**Sent:** Tuesday, March 02, 2021 12:56 PM  
**To:** Rojeck, Tristin <rojeck.tristin@epa.gov>; Kyle Strohmaier <kstrohmaier@tesla.com>  
**Cc:** Ray Wang <raywang@tesla.com>; Suraj Nagaraj <snagaraj@tesla.com>; Wehrly, Linc <wehrly.linc@epa.gov>; Wright, DavidA <Wright.DavidA@epa.gov>; Christopher Tacub <ctacub@tesla.com>  
**Subject:** Re: EPA Confirmatory Retest Criteria

Hi Tristin,  
Perhaps it would be easier to get on a quick call to discuss. Kyle, Suraj, and I would be happy to do that. We can answer a lot of your questions that you may have for **Ex. 4 CBI** as well as 12V battery. And it would be easier for us to better understand your line of reasoning for the 12V battery questions.  
Thanks  
Vineet

---

**From:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Date:** Tuesday, March 2, 2021 at 9:43 AM  
**To:** Kyle Strohmaier <kstrohmaier@tesla.com>  
**Cc:** Ray Wang <raywang@tesla.com>, Suraj Nagaraj <snagaraj@tesla.com>, Wehrly, Linc <wehrly.linc@epa.gov>, Wright, DavidA <Wright.DavidA@epa.gov>, Christopher Tacub <ctacub@tesla.com>, Vineet Mehta <vineet@tesla.com>  
**Subject:** RE: EPA Confirmatory Retest Criteria

Hello Kyle,

I appreciate the quick response.

We are discussing the **Ex. 4 CBI** internally and may have more questions.

Chris and I talked this morning and it was explained to me that the 20-30 minute soak between the end-of-test and charge sequence is likely the cause of the 12V battery issue. EPA does have a few additional questions on the 12V battery:

1. Is the 12V battery fully charged at the beginning of the test when the propulsion battery is fully charged?
2. Is the 12V battery discharge measured during the charge depleting testing?
3. Is the 12V depletion on-cycle consistent with the 12V depletion expected during a customer's drive?
4. What is the capacity of the 12V battery in watt-hours?
5. Does Tesla have control logic based on driving or SOC conditions that will impact 12V battery charging?
6. Is the fully discharged 12V battery compromised or is it useable after recharge?
7. Please explain why the HV battery pack does not accept a charge while the 12V battery is dead.

Feel free to reach out if you would like any clarifications on these questions.

Thanks,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality

U.S. Environmental Protection Agency  
(734) 214-4649

---

**From:** Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>

**Sent:** Monday, March 1, 2021 11:14 PM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Cc:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>;  
Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Subject:** RE: EPA Confirmatory Retest Criteria

Hi Tristin,

**Ex. 4 CBI**

Please let me know if you have further questions.

Kyle



# Ex. 4 CBI

---

**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Sent:** Monday, March 1, 2021 2:25 PM

**To:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Cc:** Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Subject:** RE: EPA Confirmatory Retest Criteria

Hello Vineet,

I appreciate the follow-up on this topic. There are a few issues that I would like to understand further prior to moving on to the re-test process.

# Ex. 4 CBI

# Ex. 4 CBI

Feel free to reach out if you need any clarifications on these questions.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

---

**From:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Sent:** Monday, March 1, 2021 12:22 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Subject:** Re: EPA Confirmatory Retest Criteria

Hi Tristin,

Not sure if you have had a chance to catch up with email this morning and our message from Friday below. Let us know if you have any questions for us as we are standing by. After answering your questions, we would like to discuss options with you.

Ex. 4 CBI

Again, we apologize for this error in vehicle setup and would like to do the right thing to move us forward in the direction of a representative confirmatory test on this car.

Vineet

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**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Date:** Friday, February 26, 2021 at 7:35 AM

**To:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>, Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Kyle Strohmaier <kstrohmaier@tesla.com>, Ray Wang <raywang@tesla.com>, Suraj Nagaraj <snagaraj@tesla.com>

**Subject:** RE: EPA Confirmatory Retest Criteria

I will forward your request to the laboratory, however, I do not know if staff are available to perform this task while also completing the currently scheduled tests and activities planned for today.

Regards,

David

---

**From:** Vineet Mehta <vineet@tesla.com>

**Sent:** Friday, February 26, 2021 10:23 AM

**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>

**Cc:** Kyle Strohmaier <kstrohmaier@tesla.com>; Ray Wang <raywang@tesla.com>; Suraj Nagaraj <snagaraj@tesla.com>

**Subject:** Re: EPA Confirmatory Retest Criteria

Hi David,

Sounds good. In the meantime, could you please request the lab to drive down the car to mid-SOC so that it's not spending the weekend at full state of charge?

Thanks

Vineet

---

**From:** Wright, DavidA <Wright.DavidA@epa.gov>

**Date:** Friday, February 26, 2021 at 4:39 AM

**To:** Vineet Mehta <vineet@tesla.com>, Rojeck, Tristin <rojeck.tristin@epa.gov>

**Cc:** Kyle Strohmaier <kstrohmaier@tesla.com>, Ray Wang <raywang@tesla.com>, Suraj Nagaraj <snagaraj@tesla.com>

**Subject:** RE: EPA Confirmatory Retest Criteria

Vineet,

Thank you for sharing with the Agency what you have learned regarding the vehicle's operating settings and your theory  

Ex. 4 CBI

 during the EPA confirmatory test.

Tristin is currently out of the office, he will be back at work on Monday morning. I expect that this will be the first topic on his agenda once he reads your e-mail. I expect that we will discuss what Tesla has shared with the Agency and that we will possibly be requesting additional information from you and your team.

Take care and have a good weekend.

Regards,

David

---

**From:** Vineet Mehta <vineet@tesla.com>

**Sent:** Friday, February 26, 2021 1:17 AM

**To:** Rojeck, Tristin <rojeck.tristin@epa.gov>

**Cc:** Kyle Strohmaier <kstrohmaier@tesla.com>; Ray Wang <raywang@tesla.com>; Suraj Nagaraj <snagaraj@tesla.com>; Wright, DavidA <Wright.DavidA@epa.gov>

**Subject:** Re: EPA Confirmatory Retest Criteria

Hi Tristin and David,

Thank you again for taking the time to talk with us today during the confirmatory test. After the call ended, we dived into the data:

Ex. 4 CBI

# Ex. 4 CBI

Finally, this does not affect Model 3/Y testing, as they have coil springs.

Sincere apologies

Vineet

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**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Date:** Thursday, February 25, 2021 at 1:24 PM

**To:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Cc:** Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>, Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>, Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>, Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Subject:** EPA Confirmatory Retest Criteria

Hello Vineet,

Attached is the Fuel Economy retest criteria that is used by EPA to determine the eligibility for a manufacturer to request the Agency to rerun a confirmatory test under the authority provided under 40CFR§600.008 . According to this flowchart, Tesla will be fully eligible to request a retest if the consumption or range does not confirm the Tesla internal results within 3%. I would like to highlight the portion included below, where EPA1 signifies the original confirmatory test and EPA2 signifies the retested confirmatory test:



I will be in contact with Tesla to understand if in fact a retest for the Model S Long Range will be requested once the testing sequence is complete. Please let me know if you have any questions or concerns.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

Message

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**From:** Suraj Nagaraj [snagaraj@tesla.com]  
**Sent:** 3/5/2020 7:08:48 PM  
**To:** Rojeck, Tristin [rojeck.tristin@epa.gov]; Wright, DavidA [Wright.DavidA@epa.gov]  
**CC:** Ott, William [ott.william@epa.gov]; Anderson, Tom [Anderson.Tom@epa.gov]  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Perfect. Thanks, Tristin.  
We will see you tomorrow morning at 9am  
Suraj

---

**From:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Sent:** Thursday, March 5, 2020 10:59 AM  
**To:** Suraj Nagaraj <snagaraj@tesla.com>; Wright, DavidA <Wright.DavidA@epa.gov>  
**Cc:** Ott, William <ott.william@epa.gov>; Anderson, Tom <Anderson.Tom@epa.gov>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hello Suraj,

Yes, 9:00-10:00AM works for the EPA team. See you tomorrow.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

---

**From:** Suraj Nagaraj <snagaraj@tesla.com>  
**Sent:** Thursday, March 5, 2020 1:23 PM  
**To:** Wright, DavidA <Wright.DavidA@epa.gov>  
**Cc:** Rojeck, Tristin <rojeck.tristin@epa.gov>; Ott, William <ott.william@epa.gov>; Anderson, Tom <Anderson.Tom@epa.gov>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

David,  
Were you able to sync up internally over the option of moving up the meeting to 9am ?  
  
Suraj

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**From:** Wright, DavidA <Wright.DavidA@epa.gov>  
**Sent:** Wednesday, March 4, 2020 1:50 PM  
**To:** Suraj Nagaraj <snagaraj@tesla.com>  
**Cc:** Rojeck, Tristin <rojeck.tristin@epa.gov>; Ott, William <ott.william@epa.gov>; Anderson, Tom <Anderson.Tom@epa.gov>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Not sure about Tristin, Will, or Tom, but I have another meeting from 10 til 11, I could meet at 9 so I need to check with the others to see if they would be available then.

Regards,

David

---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Wednesday, March 04, 2020 4:42 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Thanks, David,  
We'll plan on flying into DTW in the morning and fly out that afternoon. Any chance we could meet earlier in the morning instead of at 11am EST?  
Suraj

---

**From:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Sent:** Wednesday, March 4, 2020 11:00 AM  
**To:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Vineet,

Thank you for the additional information on the software error that was discovered during the soaking of your vehicle prior to EPA performing confirmatory testing.

You are free to visit Ann Arbor for our meeting, it's your call. We have the time scheduled and can meet you at the lobby or call you on the telephone.

Tristin, Will, and I are continuing to develop our initial list of questions and will get them to you later this afternoon.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>  
**Sent:** Wednesday, March 04, 2020 1:40 PM

**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Suraj Nagaraj <snagaraj@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>

**Cc:** Ray Wang <raywang@tesla.com>; Ott, William <ott.william@epa.gov>

**Subject:** Re: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi David, Tristin, Will,

“...Tesla’s proposal to modify your software based on EPA not confirming your current results..”

Actually, it’s more nuanced than that David. Through the confirmatory test, we uncovered a corner case which led us to a firmware bug we hadn’t previously found on our own. The car didn’t sleep because two conditions were true

1. Car was not locked AND
2. Firmware in the car interpreted the charge session to be a ‘fast charge’. Hence the display was left ON with the logic that when customers are fast charging their vehicle, they occasionally want to see how fast they are accumulating charge on the display. The determination of ‘fast’ vs. ‘slow’ charge was done by line voltage (greater than 140V). This is a flawed approach because fast charge should be determined by power, not voltage.

We didn’t uncover the 2<sup>nd</sup> point because when the car is locked, the display is turned off and the car goes to sleep regardless of the charge type. With this find, we would like to fix this logic and rerun the internal test with updated production firmware.

As Suraj suggested, it will be much easier to explain this nuance and answer the rest of your questions if we meet you in person Friday morning. May we come see you then?

Vineet

---

**From:** DavidA Wright <Wright.DavidA@epa.gov>

**Date:** Wednesday, March 4, 2020 at 6:07 AM

**To:** Suraj Nagaraj <snagaraj@tesla.com>, "Rojeck, Tristin" <rojeck.tristin@epa.gov>

**Cc:** Vineet Mehta <vineet@tesla.com>, Ray Wang <raywang@tesla.com>, William Ott <ott.william@epa.gov>

**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Suraj,

Thank you for your e-mail. Tristin, Will, and I need to review and discuss your request. I expect that we will have numerous questions for you regarding the current testing Tesla has completed, Tesla’s proposal to modify your software based on EPA not confirming your current results, and your highly unusual request to re-start the EPA confirmatory testing process with an entirely new fuel economy data vehicle (FEDV) – which raises significant additional questions, which we will be providing later today.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467



---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Wednesday, March 04, 2020 12:32 AM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi Tristin & David,

Thanks for sending us the results from the confirmatory test. As you already know this result is more than 10 miles lower than our internal test submission results. After look through our internal data, we have determined several things that did not go well with the confirmatory test at the EPA labs.

1. Net discharge energy out of the pack was ~3kWh (3%) less than expected (and what we measured during our internal test). This was largely because, after the end of charge, instead of going to sleep, the car remained awake from midnight to 7AM burning valuable energy. We noticed that the car was not locked and the keys were kept inside the car. Our current FW keeps the car awake when it is not locked. This is a fundamental issue that prevents the car from sleeping and also was the primary reason for us not getting representative/expected capacity out of the pack. Needless to say, a fix is currently in the works and will be rolled out to the customer fleet immediately.

2. Moreover, the CSM distance driven was several miles higher than our internal test. As a result, the start SOC For CSE was lower than our test leaving barely any power to get to 65mph for the last section. As witnessed by Arlene, the car was briefly outside the speed trace tolerance getting up to 65mph. Thereafter, it only drove 5 miles before. As a comparison, on the internal test more than 7% of the MCT miles were driven on the last constant speed section. On the EPA test, only 1.3% of the MCT miles were driven on the same section. If the CSM section was shorter by a few miles, we would have had more margin for the last section.

Since the highway portion of the MCT confirmatory test did not meet the 3% tolerance, we are allowed to legally request a retest. However, That would not be representative of the true Fuel Economy rating for this car due to the following reasons,

- A. EPA regulations do not allow us to make any changes to the vehicle after submission. Running another test on the same car will most likely result in the same outcome.
- B. Per Confirmatory test rules, the final results would be a harmonic average of the two tests.

**Proposed Next Step:**

Given the restrictions above and our assessment of the confirmatory test results, we would like to pull this application back and resubmit a new internal MCT test dataset on a new vehicle (that has the firmware fix) which EPA is welcome to confirm. We understand that the overall timeline for launch of this vehicle will be delayed but we rather delay the program than accept a non-representative result. We will also have an opportunity to provide a better margin for the CSE section of the MCT so that its closer to the SAE procedure. With an active change induced on the vehicle (in this case, the firmware fix) we continue to remain within the spirit of the regulations and aren't trying to maximize our chances of a higher range value just by requesting a retest on the same car.

We believe these nuances are easier to discuss face to face or on the phone. May we please schedule a phone call tomorrow (as previously suggested by Tristin) instead of Friday?

Thanks  
Suraj

---

**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Sent:** Tuesday, March 3, 2020 1:29 PM  
**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>

**Subject:** EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hello Suraj and Ray,

Attached are the MCT results from the Model S LR+ testing on February 26, 2020. The combined label range value is Ex. 4 CBI miles based on this test. I was wondering if your team had time tomorrow at 4PM EST (1PM PST) to discuss these results and next steps.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

Message

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**From:** Wright, DavidA [Wright.DavidA@epa.gov]  
**Sent:** 3/5/2020 8:02:00 PM  
**To:** Suraj Nagaraj [snagaraj@tesla.com]; Vineet Mehta [vineet@tesla.com]; Rojeck, Tristin [rojeck.tristin@epa.gov]  
**CC:** Ray Wang [raywang@tesla.com]; Ott, William [ott.william@epa.gov]  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

I am interested in the individual UDDS results which have been used to calculate the Cold\_City value which is indicated in the spreadsheets as the Tesla Data – Full Depletion 20°F UDDS Result. Tesla had to have recorded the individual bag portions of the UDDS cycles, as was done the Bag 1 through Bag 4 individual FE results, to determine the full depletion value. EPA seeks the data used to calculate the average for the Full Depletion 20°F UDDS Tests.

Regards,

David

---

**From:** Suraj Nagaraj <snagaraj@tesla.com>  
**Sent:** Thursday, March 05, 2020 2:55 PM  
**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Vineet Mehta <vineet@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Ray Wang <raywang@tesla.com>; Ott, William <ott.william@epa.gov>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi David,  
Ray typically sends out these out to Tristin as part of the initial submission but here is another copy of the calculators. Both these continue to reflect our internal test results.  
Suraj

---

**From:** Wright, DavidA <Wright.DavidA@epa.gov>  
**Sent:** Thursday, March 5, 2020 11:38 AM  
**To:** Vineet Mehta <vineet@tesla.com>; Suraj Nagaraj <snagaraj@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Ray Wang <raywang@tesla.com>; Ott, William <ott.william@epa.gov>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Vineet and Suraj,

Please provide me, Tristin, and Will copies of the 5-cycle calculator Tesla used to generate the adjustment factors for the both the Model X and the Model S Long Range Plus models. Include with the calculator the bag by bag UDDS consumption and drive cycle metrics for the 20 F charge depletion tests Tesla performed on each vehicle.

Let me know if you have any questions regarding this request.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality

---

**From:** Wright, DavidA

**Sent:** Wednesday, March 04, 2020 5:41 PM

**To:** Vineet Mehta <vineet@tesla.com>; Suraj Nagaraj <snagaraj@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>

**Cc:** Ray Wang <raywang@tesla.com>; Ott, William <ott.william@epa.gov>

**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Vineet and Suraj,

It is our understanding that the charging logic used by Tesla Ex. 4 CBI

**Ex. 4 CBI**

Ex. 4 CBI

expect that this will be a topic of further discussion for our meeting on Friday.

EPA is also interested in understanding how Tesla has performed, or determined, the road load forces for the Model 3 Long Range Plus. We are interested in understanding the operation of the ride height system and any other active aerodynamic features (louvers or other features) and how those are controlled during the road load determination.

EPA is also interested in understanding if Tesla modifies the control and operation of the friction braking system and the integration of friction braking with the regenerative braking function when the vehicle is operated on the chassis dynamometer in comparison to how the system functions when not in dynamometer mode. In particular the Agency is interested in how the friction brakes operate when the vehicle is decelerated to a stop.

Please provide a detailed description of the disk brake wipe function and how it operates. Please explain why Tesla believes this function should be disabled for dynamometer mode.

Please provide the following information for Tesla fuel economy data vehicle (FEDV) SD220-364368:

Describe the process Tesla used to select this vehicle to be the FEDV;

Describe the process used to break-in the vehicle and accumulate mileage prior to performing any charge depleting tests;

Describe any and all maintenance that has been performed on the vehicle; and,

Describe any and all measurements made of any components, or component testing performed, prior to their assembly in the FEDV including drive inverters, drive motors, transaxle, friction brakes, battery pack, or any other non-drivetrain component that would be powered during the performance of charge depletion testing.

As there are no overt signs of failures on the vehicle and no warning lights were lit on the vehicle at the time the testing concluded, what is the rationale that this vehicle is no longer representative and should be re-tested?

Please describe all of the driver selectable modes available on the Model S Long Range Plus and how the various modes latch. In addition describe the impact of the modes on energy consumption during chassis dynamometer

MCT testing and if there are any differences in consumption between operation on the chassis dynamometer versus operation on the road.

Please provide detailed descriptions of CREEP, HOLD, and ROLL mode and describe how Tesla set these modes for the Model 3 Long Range Plus. Please describe why the mode tested was appropriate since owners can latch these modes. Please review EPA guidance letter CD-09-19 and explain which is the appropriate mode for testing and whether Tesla should test the vehicle in best and worst case modes.

Please explain if one-pedal driving is the normal mode of driving and relates to selecting HOLD mode as the appropriate Stopping Mode, or, is one-pedal driving a separate selection from a nominal two-pedal driving mode.

It is EPA's understanding that Tesla performed complete charge depletion testing during the 20F UDDS testing as opposed to stopping when the energy consumption stabilized and the vehicle was fully warmed up. It was EPA's understanding that the intention of testing multiple UDDS cycles was done to capture the energy recovery and once the UDDS energy consumption stabilized, i.e. the vehicle could capture regeneration energy and the battery and drive system was fully warmed up the testing would be stopped. As different vehicles had different battery capacities and it was thought that some lower range vehicles could possibly deplete prior to reaching a fully stabilized battery temperature, it was our understanding the test procedure was left open, including full charge depletion operation, expected on lower range BEVs.

Allowing testing in the 20F cell until full charge depletion provides an advantage to vehicles with larger capacity batteries, which was not the intention of allowing multiple UDDS cycles. We are in the process of reviewing the impact of battery capacity on the adjustment factor when performing full charge depletion testing and are evaluating developing an appropriate means to determine an end of test criteria other than completely depleting the battery. In addition, we plan to discuss the test process for performing the 20F UDDS tests as the UDDS cycle consists of a minimum 10 minute soak between cycles, and, it appears this criteria has not been captured in the current J1634 standard.

Let me know if there are other topics you would like to discuss and if you have any questions or need any additional information. I will get back with you tomorrow morning if you have any further questions or comments.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>  
**Sent:** Wednesday, March 04, 2020 1:40 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>  
**Subject:** Re: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi David, Tristin, Will,

"...Tesla's proposal to modify your software based on EPA not confirming your current results.."

Actually, it's more nuanced than that David. Through the confirmatory test, we uncovered a corner case which led us to a firmware bug we hadn't previously found on our own. The car didn't sleep because two conditions were true

1. Car was not locked AND
2. Firmware in the car interpreted the charge session to be a 'fast charge'. Hence the display was left ON with the logic that when customers are fast charging their vehicle, they occasionally want to see how fast they are accumulating charge on the display. The determination of 'fast' vs. 'slow' charge was done by line voltage (greater than 140V). This is a flawed approach because fast charge should be determined by power, not voltage.

We didn't uncover the 2<sup>nd</sup> point because when the car is locked, the display is turned off and the car goes to sleep regardless of the charge type. With this find, we would like to fix this logic and rerun the internal test with updated production firmware.

As Suraj suggested, it will be much easier to explain this nuance and answer the rest of your questions if we meet you in person Friday morning. May we come see you then?

Vineet

---

**From:** DavidA Wright <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Date:** Wednesday, March 4, 2020 at 6:07 AM

**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>, "Rojeck, Tristin" <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>, Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>, William Ott <[ott.william@epa.gov](mailto:ott.william@epa.gov)>

**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Suraj,

Thank you for your e-mail. Tristin, Will, and I need to review and discuss your request. I expect that we will have numerous questions for you regarding the current testing Tesla has completed, Tesla's proposal to modify your software based on EPA not confirming your current results, and your highly unusual request to re-start the EPA confirmatory testing process with an entirely new fuel economy data vehicle (FEDV) – which raises significant additional questions, which we will be providing later today.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Sent:** Wednesday, March 04, 2020 12:32 AM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi Tristin & David,

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1. Net discharge energy out of the pack was ~3kWh (3%) less than expected (and what we measured during our internal test). This was largely because, after the end of charge, instead of going to sleep, the car remained awake from midnight to 7AM burning valuable energy. We noticed that the car was not locked and the keys were kept inside the car. Our current FW keeps the car awake when it is not locked. This is a fundamental issue that prevents the car from sleeping and also was the primary reason for us not getting representative/expected capacity out of the pack. Needless to say, a fix is currently in the works and will be rolled out to the customer fleet immediately.

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**Sent:** Tuesday, March 3, 2020 1:29 PM  
**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Cc:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Subject:** EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

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Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
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Message

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**From:** Wright, DavidA [Wright.DavidA@epa.gov]  
**Sent:** 3/5/2020 8:51:09 PM  
**To:** Suraj Nagaraj [snagaraj@tesla.com]; Vineet Mehta [vineet@tesla.com]; Rojeck, Tristin [rojeck.tristin@epa.gov]  
**CC:** Ray Wang [raywang@tesla.com]; Ott, William [ott.william@epa.gov]  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

In Cell C23 Tesla has a value for the 20F Full Depletion UDDS test result. Please provide the Agency with the dc consumption, distance and drive cycle metrics for each UDDS cycle used to determine this average for both the MX\_LR+ and the MS\_LR+.

Regards,

David

---

**From:** Suraj Nagaraj <snagaraj@tesla.com>  
**Sent:** Thursday, March 05, 2020 2:55 PM  
**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Vineet Mehta <vineet@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Ray Wang <raywang@tesla.com>; Ott, William <ott.william@epa.gov>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi David,

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Suraj

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**To:** Vineet Mehta <vineet@tesla.com>; Suraj Nagaraj <snagaraj@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
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Let me know if you have any questions regarding this request.

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Please provide the following information for Tesla fuel economy data vehicle (FEDV) SD220-364368:

Describe the process Tesla used to select this vehicle to be the FEDV;

Describe the process used to break-in the vehicle and accumulate mileage prior to performing any charge depleting tests;

Describe any and all maintenance that has been performed on the vehicle; and,

Describe any and all measurements made of any components, or component testing performed, prior to their assembly in the FEDV including drive inverters, drive motors, transaxle, friction brakes, battery pack, or any other non-drivetrain component that would be powered during the performance of charge depletion testing.

As there are no overt signs of failures on the vehicle and no warning lights were lit on the vehicle at the time the testing concluded, what is the rationale that this vehicle is no longer representative and should be re-tested?

Please describe all of the driver selectable modes available on the Model S Long Range Plus and how the various modes latch. In addition describe the impact of the modes on energy consumption during chassis dynamometer MCT testing and if there are any differences in consumption between operation on the chassis dynamometer versus operation on the road.

Please provide detailed descriptions of CREEP, HOLD, and ROLL mode and describe how Tesla set these modes for the Model 3 Long Range Plus. Please describe why the mode tested was appropriate since owners can latch these modes. Please review EPA guidance letter CD-09-19 and explain which is the appropriate mode for testing and whether Tesla should test the vehicle in best and worst case modes.

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It is EPA's understanding that Tesla performed complete charge depletion testing during the 20F UDDS testing as opposed to stopping when the energy consumption stabilized and the vehicle was fully warmed up. It was EPA's understanding that the intention of testing multiple UDDS cycles was done to capture the energy recovery and once the UDDS energy consumption stabilized, i.e. the vehicle could capture regeneration energy and the battery and drive system was fully warmed up the testing would be stopped. As different vehicles had different battery capacities and it was thought that some lower range vehicles could possibly deplete prior to reaching a fully stabilized battery temperature, it was our understanding the test procedure was left open, including full charge depletion operation, expected on lower range BEVs.

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Let me know if there are other topics you would like to discuss and if you have any questions or need any additional information. I will get back with you tomorrow morning if you have any further questions or comments.

Regards,

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David Wright  
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Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
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---

**From:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>

**Sent:** Wednesday, March 04, 2020 1:40 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

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**Subject:** Re: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi David, Tristin, Will,

"...Tesla's proposal to modify your software based on EPA not confirming your current results.."

Actually, it's more nuanced than that David. Through the confirmatory test, we uncovered a corner case which led us to a firmware bug we hadn't previously found on our own. The car didn't sleep because two conditions were true

1. Car was not locked AND

2. Firmware in the car interpreted the charge session to be a 'fast charge'. Hence the display was left ON with the logic that when customers are fast charging their vehicle, they occasionally want to see how fast they are accumulating charge on the display. The determination of 'fast' vs. 'slow' charge was done by line voltage (greater than 140V). This is a flawed approach because fast charge should be determined by power, not voltage.

We didn't uncover the 2<sup>nd</sup> point because when the car is locked, the display is turned off and the car goes to sleep regardless of the charge type. With this find, we would like to fix this logic and rerun the internal test with updated production firmware.

As Suraj suggested, it will be much easier to explain this nuance and answer the rest of your questions if we meet you in person Friday morning. May we come see you then?

Vineet

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**From:** DavidA Wright <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>

**Date:** Wednesday, March 4, 2020 at 6:07 AM

**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>, "Rojeck, Tristin" <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>, Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>, William Ott <[ott.william@epa.gov](mailto:ott.william@epa.gov)>

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Message

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**From:** Wright, DavidA [Wright.DavidA@epa.gov]  
**Sent:** 3/5/2020 10:07:21 PM  
**To:** Suraj Nagaraj [snagaraj@tesla.com]; Vineet Mehta [vineet@tesla.com]; Rojeck, Tristin [rojeck.tristin@epa.gov]  
**CC:** Ray Wang [raywang@tesla.com]; Ott, William [ott.william@epa.gov]  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Suraj,

Thank you for providing the data.

Regards,

David

---

**From:** Suraj Nagaraj <snagaraj@tesla.com>  
**Sent:** Thursday, March 05, 2020 5:03 PM  
**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Vineet Mehta <vineet@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Ray Wang <raywang@tesla.com>; Ott, William <ott.william@epa.gov>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi David

Please see the attached 20F individual bag data that was used to populate the cell C23 of the overall 5 cycle calculator. I want to re-iterate that when I meant "internal data", I actually meant official test results that are in compliance with Part 600 and Part 86. These are not simply internal tests and we have all the required datasets (used to generate the label) stored in secured databases.

As for the type of data to be inputted into EV-CIS, I believe Ray has had discussions with you and Tristin on the limitations of the system and how best we can supply the information but I am happy to revisit that topic in the next week.

Suraj

---

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**To:** Suraj Nagaraj <snagaraj@tesla.com>; Vineet Mehta <vineet@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Ray Wang <raywang@tesla.com>; Ott, William <ott.william@epa.gov>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Suraj,

I want to point out that the test results that Tesla has generated and used for determining your adjustment factor are official tests and are required to be performed in accordance with the regulations in Part 600 and Part 86 these are not simply internal test results. The data are expected to be loaded into EV-CIS and EPA has the opportunity to perform a confirmatory test on any of the 5-cycle tests which Tesla performs and utilizes to generate a 5-cycle result. EPA regulations require manufacturers measure on a per phase basis the individual phase results for all tests including the US06, SC03, and Cold CO test (i.e. 20 F UDDS cycles). In addition, Tesla is required to maintain these records according to EPA regulations and provide these records upon request.

As EPA has indicated previously in our multiple discussions over the years all of the data Tesla generates for 5-cycle testing needs to be input into Verify. The individual bag results need to be loaded into the system in addition to the results for the entire test.

As I look at the data entered in EV-CIS for XD220-234408 I see a charge depleting 20 F test however I do not see any of the individual bag data used to generate the FE value. It is these data that Tesla needs to provide. And, again, these data are required to be recorded during testing and reported to the Agency.

Regards,

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Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>  
**Sent:** Wednesday, March 04, 2020 1:40 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>  
**Subject:** Re: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi David, Tristin, Will,

"...Tesla's proposal to modify your software based on EPA not confirming your current results.."

Actually, it's more nuanced than that David. Through the confirmatory test, we uncovered a corner case which led us to a firmware bug we hadn't previously found on our own. The car didn't sleep because two conditions were true

1. Car was not locked AND
2. Firmware in the car interpreted the charge session to be a 'fast charge'. Hence the display was left ON with the logic that when customers are fast charging their vehicle, they occasionally want to see how fast they are accumulating charge on the display. The determination of 'fast' vs. 'slow' charge was done by line voltage (greater than 140V). This is a flawed approach because fast charge should be determined by power, not voltage.

We didn't uncover the 2<sup>nd</sup> point because when the car is locked, the display is turned off and the car goes to sleep regardless of the charge type. With this find, we would like to fix this logic and rerun the internal test with updated production firmware.

As Suraj suggested, it will be much easier to explain this nuance and answer the rest of your questions if we meet you in person Friday morning. May we come see you then?

Vineet

---

**From:** DavidA Wright <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Date:** Wednesday, March 4, 2020 at 6:07 AM  
**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>, "Rojeck, Tristin" <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>, Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>, William Ott <[ott.william@epa.gov](mailto:ott.william@epa.gov)>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Suraj,

Thank you for your e-mail. Tristin, Will, and I need to review and discuss your request. I expect that we will have numerous questions for you regarding the current testing Tesla has completed, Tesla's proposal to modify your software based on EPA not confirming your current results, and your highly unusual request to re-start the EPA confirmatory testing process with an entirely new fuel economy data vehicle (FEDV) – which raises significant additional questions, which we will be providing later today.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Wednesday, March 04, 2020 12:32 AM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi Tristin & David,

Thanks for sending us the results from the confirmatory test. As you already know this result is more than 10 miles lower than our internal test submission results. After look through our internal data, we have determined several things that did not go well with the confirmatory test at the EPA labs.

1. Net discharge energy out of the pack was ~3kWh (3%) less than expected (and what we measured during our internal test). This was largely because, after the end of charge, instead of going to sleep, the car remained awake from midnight to 7AM burning valuable energy. We noticed that the car was not locked and the keys were kept inside the car. Our current FW keeps the car awake when it is not locked. This is a fundamental issue that prevents the car from sleeping and also was the primary reason for us not getting representative/expected capacity out of the pack. Needless to say, a fix is currently in the works and will be rolled out to the customer fleet immediately.

2. Moreover, the CSM distance driven was several miles higher than our internal test. As a result, the start SOC For CSE was lower than our test leaving barely any power to get to 65mph for the last section. As witnessed by Arlene, the car was briefly outside the speed trace tolerance getting up to 65mph. Thereafter, it only drove 5 miles before. As a comparison, on the internal test more than 7% of the MCT miles were driven on the last constant speed section. On the EPA test, only 1.3% of the MCT miles were driven on the same section. If the CSM section was shorter by a few miles, we would have had more margin for the last section.

Since the highway portion of the MCT confirmatory test did not meet the 3% tolerance, we are allowed to legally request a retest. However, That would not be representative of the true Fuel Economy rating for this car due to the following reasons,

- A. EPA regulations do not allow us to make any changes to the vehicle after submission. Running another test on the same car will most likely result in the same outcome.
- B. Per Confirmatory test rules, the final results would be a harmonic average of the two tests.

#### Proposed Next Step:

Given the restrictions above and our assessment of the confirmatory test results, we would like to pull this application back and resubmit a new internal MCT test dataset on a new vehicle (that has the firmware fix) which EPA is welcome to confirm. We understand that the overall timeline for launch of this vehicle will be delayed but we rather delay the program than accept a non-representative result. We will also have an opportunity to provide a better margin for the CSE section of the MCT so that its closer to the SAE procedure. With an active change induced on the vehicle (in this case, the firmware fix) we continue to remain within the spirit of the regulations and aren't trying to maximize our chances of a higher range value just by requesting a retest on the same car.


We believe these nuances are easier to discuss face to face or on the phone. May we please schedule a phone call tomorrow (as previously suggested by Tristin) instead of Friday?

Thanks  
Suraj

---

**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Sent:** Tuesday, March 3, 2020 1:29 PM  
**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Cc:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Subject:** EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hello Suraj and Ray,

Attached are the MCT results from the Model S LR+ testing on February 26, 2020. The combined label range value is  miles based on this test. I was wondering if your team had time tomorrow at 4PM EST (1PM PST) to discuss these results and next steps.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

Message

**From:** Vineet Mehta [vineet@tesla.com]  
**Sent:** 3/5/2020 10:41:41 PM  
**To:** Wright, DavidA [Wright.DavidA@epa.gov]; Suraj Nagaraj [snagaraj@tesla.com]; Rojeck, Tristin [rojeck.tristin@epa.gov]  
**CC:** Ray Wang [raywang@tesla.com]; Ott, William [ott.william@epa.gov]  
**Subject:** Re: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Hi David,  
See responses to your questions in line below.  
Looking forward to seeing you tomorrow.  
Vineet

**From:** DavidA Wright <Wright.DavidA@epa.gov>  
**Date:** Wednesday, March 4, 2020 at 2:40 PM  
**To:** Vineet Mehta <vineet@tesla.com>, Suraj Nagaraj <snagaraj@tesla.com>, "Rojeck, Tristin" <rojeck.tristin@epa.gov>  
**Cc:** Ray Wang <raywang@tesla.com>, William Ott <ott.william@epa.gov>  
**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

Vineet and Suraj,

It is our understanding that the charging logic used by Tesla

Ex. 4 CBI

**Ex. 4 CBI**

Ex. 4 CBI

I expect that this will be a topic of further discussion for our meeting on Friday. Yes, happy to discuss in more detail on Friday.

EPA is also interested in understanding how Tesla has performed, or determined, the road load forces for the Model 3 Long Range Plus. We are interested in understanding the operation of the ride height system and any other active aerodynamic features (louvers or other features) and how those are controlled during the road load determination.

Ex. 4 CBI

**Ex. 4 CBI**

of the SC03 cycle, this has no material impact on the energy consumption. Additional aero power is the cube root of speed.

EPA is also interested in understanding if Tesla modifies the control and operation of the friction braking system and the integration of friction braking with the regenerative braking function when the vehicle is operated on the chassis dynamometer in comparison to how the system functions when not in dynamometer mode.

Ex. 4 CBI

## Ex. 4 CBI

Please provide a detailed description of the disk brake wipe function and how it operates. Please explain why Tesla believes this function should be disabled for dynamometer mode.

Ex. 4 CBI

## Ex. 4 CBI

Please provide the following information for Tesla fuel economy data vehicle (FEDV) SD220-364368:

Describe the process Tesla used to select this vehicle to be the FEDV;  
Vehicle was randomly picked from the production assembly line.

Describe the process used to break-in the vehicle and accumulate mileage prior to performing any charge depleting tests;  
Per SAE we drive the vehicle on the dyno for 1000 miles with the appropriate road load.

Describe any and all maintenance that has been performed on the vehicle; and,  
This vehicle got an alignment and check of all fluids before testing. No other repair or maintenance was required or performed .

Describe any and all measurements made of any components, or component testing performed, prior to their assembly in the FEDV including drive inverters, drive motors, transaxle, friction brakes, battery pack, or any other non-drivetrain component that would be powered during the performance of charge depletion testing. Once the car is selected, serial number of some components are ascertained and referenced against component population data to make sure they fall within 1 standard deviation.

Ex. 4 CBI

Ex. 4 CBI

As there are no overt signs of failures on the vehicle and no warning lights were lit on the vehicle at the time the testing concluded, what is the rationale that this vehicle is no longer representative and should be re-tested –

## Ex. 4 CBI

Please describe all of the driver selectable modes available on the Model S Long Range Plus and how the various modes latch. In addition describe the impact of the modes on energy consumption during chassis dynamometer MCT testing and if there are any differences in consumption between operation on the chassis dynamometer versus operation on the road.

Please provide detailed descriptions of CREEP, HOLD, and ROLL mode and describe how Tesla set these modes for the Model 3 Long Range Plus. Please describe why the mode tested was appropriate since owners can latch these modes. Please review EPA guidance letter CD-09-19 and explain which is the appropriate mode for testing and whether Tesla should test the vehicle in best and worst case modes. All the driver selectable modes have been previously shared with the EPA in the screenshots we provided. They all latch the same way. For testing, we select them based on how they are configured when the vehicle comes out of the factory. All modes are similar to previous versions of the Model S. the only new ones with long range plus are – HOLD, DOG mode, SENTRY mode, JOE Mode, and CAMPING mode. All of these are turned off when the vehicle leaves the factory.

Please explain if one-pedal driving is the normal mode of driving and relates to selecting HOLD mode as the appropriate Stopping Mode, or, is one-pedal driving a separate selection from a nominal two-pedal driving mode. One pedal driving is the same as HOLD and the default mode in which we deliver the car to the customer.

It is EPA's understanding that Tesla performed complete charge depletion testing during the 20F UDDS testing as opposed to stopping when the energy consumption stabilized and the vehicle was fully warmed up. It was EPA's understanding that the intention of testing multiple UDDS cycles was done to capture the energy recovery and once the UDDS energy consumption stabilized, i.e. the vehicle could capture regeneration energy and the battery and drive system was fully warmed up the testing would be stopped. As different vehicles had different battery capacities and it was thought that some lower range vehicles could possibly deplete prior to reaching a fully stabilized battery temperature, it was our understanding the test procedure was left open, including full charge depletion operation, expected on lower range BEVs.

Ex. 4 CBI

Ex. 4 CBI

Allowing testing in the 20F cell until full charge depletion provides an advantage to vehicles with larger capacity batteries, which was not the intention of allowing multiple UDDS cycles. Stabilization of consumption is not related to just stabilization of the battery temperature. We are in the process of reviewing the impact of battery capacity on the adjustment factor when performing full charge depletion testing and are evaluating developing an appropriate means to determine an end of test criteria other than completely depleting the battery. In addition, we plan to discuss the test process for performing the 20F UDDS tests as the UDDS cycle consists of a minimum 10 minute soak between cycles, and, it appears this criteria has not been captured in the current J1634 standard. Ok. However, this will increase the testing burden from 19 hours to 27 hours, unless we use the average of the last 5 cycles once stabilized or allow preconditioning of the pack as accommodated by the draft SAE J1634.

Let me know if there are other topics you would like to discuss and if you have any questions or need any additional information. Yes, we would like to discuss preconditioning of the cabin and powertrain as highlighted in the upcoming SAE J1634 draft procedures. I will get back with you tomorrow morning if you have any further questions or comments.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Vineet Mehta <vineet@tesla.com>

**Sent:** Wednesday, March 04, 2020 1:40 PM

**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Suraj Nagaraj <snagaraj@tesla.com>; Rojeck, Tristin



<rojeck.tristin@epa.gov>

**Cc:** Ray Wang <raywang@tesla.com>; Ott, William <ott.william@epa.gov>

**Subject:** Re: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

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**Date:** Wednesday, March 4, 2020 at 6:07 AM

**To:** Suraj Nagaraj <snagaraj@tesla.com>, "Rojeck, Tristin" <rojeck.tristin@epa.gov>

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David Wright  
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**From:** Suraj Nagaraj <snagaraj@tesla.com>

**Sent:** Wednesday, March 04, 2020 12:32 AM

**To:** Rojeck, Tristin <rojeck.tristin@epa.gov>; Wright, DavidA <Wright.DavidA@epa.gov>

**Cc:** Vineet Mehta <vineet@tesla.com>; Ray Wang <raywang@tesla.com>

**Subject:** RE: EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

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Suraj

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**From:** Rojeck, Tristin <rojeck.tristin@epa.gov>

**Sent:** Tuesday, March 3, 2020 1:29 PM

**To:** Ray Wang <raywang@tesla.com>; Suraj Nagaraj <snagaraj@tesla.com>

**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>

**Subject:** EPA MY20 Tesla Model S LR+ MCT Results (2.26.2020)

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Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

Message

---

**From:** Wright, DavidA [Wright.DavidA@epa.gov]  
**Sent:** 4/8/2020 8:39:48 PM  
**To:** Ray Wang [raywang@tesla.com]; Rojeck, Tristin [rojeck.tristin@epa.gov]  
**CC:** Suraj Nagaraj [snagaraj@tesla.com]; Wehrly, Linc [wehrly.linc@epa.gov]; Ott, William [ott.william@epa.gov]; Vineet Mehta [vineet@tesla.com]  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory Ray,test

Ray,

Please also provide an answer to the questions of how the vehicles on the market today,

Ex. 4 CBI

## Ex. 4 CBI

I have also sent you a separate e-mail asking for additional information regarding the graphs on slide 4 and slide 5 of the presentation Tesla has previously submitted to EPA on March 27<sup>th</sup>.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Wright, DavidA  
**Sent:** Wednesday, April 08, 2020 4:24 PM  
**To:** 'Ray Wang' <raywang@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Cc:** Suraj Nagaraj <snagaraj@tesla.com>; Wehrly, Linc <wehrly.linc@epa.gov>; Ott, William <ott.william@epa.gov>; Vineet Mehta <vineet@tesla.com>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

From the guidance letter –

### Survey Requirements and Fuel Economy Submissions for First Year Vehicles with Driver-Selectable Modes

If the manufacturer is unable to establish a predominant mode prior to production of the first model year of a driver-selectable device design, the manufacturer may submit fuel economy data for one mode, provided they use good engineering judgment in the selection of that mode. However, survey results should be obtained before the end of the model year, and depending on the results, actions may be required under EPA fuel economy regulations. Survey requirement applicability depends on the weight-to-horsepower ratio for tested subconfigurations, as described in "Establishing the Predominant Driver-Selectable Mode" section below.

If the survey results meet the predominance criteria for the tested mode, no additional actions are required. If the survey results fail to meet the predominance criteria for the tested mode, the vehicle manufacturer should comply with the following:

- (a) Run fuel economy tests in the two extreme modes or, alternatively, (with prior EPA approval) in the two most prevalent modes.
- (b) Recalculate label values under §600.314-08(e)(2) based on harmonically averaged data from paragraph (a) above.
- (c) If necessary, under §600.314-08(e)(4)
  - (i) Re-label all affected vehicles
  - (ii) Update the entire label, including the Gas Guzzler Tax, under §600.314-08(e)(5).
- (d) CAFE will be based on harmonically averaged data.

---

**From:** Ray Wang <raywang@tesla.com>

**Sent:** Wednesday, April 08, 2020 4:13 PM

**To:** Wright, DavidA <Wright.DavidA@epa.gov>; Rojeck, Tristin <rojeck.tristin@epa.gov>

**Cc:** Suraj Nagaraj <snagaraj@tesla.com>; Wehrly, Linc <wehrly.linc@epa.gov>; Ott, William <ott.william@epa.gov>; Vineet Mehta <vineet@tesla.com>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hi David,

Thank you for your thoughts on the one-pedal mode. I'm a little confused with why the data we provided would not be applicable for the LR+ because it's an entirely new model. The data we provided is from the whole Model S/X fleet. LR+ customer selection won't be any different than the entire fleet. It should be able to carry over from the fleet data. Similar case for the regen selection: Ex. 4 CBI based on the fleet data. Can you point out the criteria for us?

Regarding the Ex. 4 CBI could you help us confirming which section in the CISD-09-19 letter indicates that? With the fleet stopping mode preference data, it shows the Ex. 4 CBI Ex. 4 CBI has the dominant take rate of all.

Thank you

Regards,

**Ray Wang** | Engineer, Homologation

901 Page Ave, Fremont, CA 94538

m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)

**T E S L A**

---

**From:** Wright, DavidA <Wright.DavidA@epa.gov>

**Sent:** Wednesday, April 8, 2020 11:29 AM

**To:** Ray Wang <raywang@tesla.com>; Rojeck, Tristin <rojeck.tristin@epa.gov>

**Cc:** Suraj Nagaraj <snagaraj@tesla.com>; Wehrly, Linc <wehrly.linc@epa.gov>; Ott, William <ott.william@epa.gov>; Vineet Mehta <vineet@tesla.com>

**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Ray,

Having reviewed the material Tesla has provided regarding mode usage it does not appear to EPA that one-pedal mode meets the predominant mode definition in EPA guidance letter CISD-09-19. It is also unclear to EPA that the

data provided would be applicable for the Model S LR+ as this is an entirely new model according to Tesla and therefore usage data are not available for this new model.

This also raises additional questions for EPA regarding the range and consumption testing and labeling of other Tesla models as the information on Page 4 of the March 27<sup>th</sup> 2020 Tesla presentation indicates this mode can be found in current Tesla models on the road, and, the data submitted indicate the predominant criteria are not met for this single mode to be used for labeling for these vehicles.

We can further discuss this at your convenience. I expect you will have additional questions. Please do not hesitate to contact me. As I am currently teleworking it would be best to determine a time for a conference call if that would be preferable for Tesla's staff.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Sent:** Wednesday, April 08, 2020 1:53 PM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Subject:** RE: MS LR+ FE label and up-coming program confirmatory test

Hi Tristin,

Just following up on this email. Do you have any updates for us?

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**TESLA**

---

**From:** Ray Wang  
**Sent:** Monday, April 6, 2020 10:35 AM  
**To:** Rojeck, Tristin (<[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>) <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Subject:** MS LR+ FE label and up-coming program confirmatory test

Hi Tristin,

For next model year (MY21), we will have Model S and X Ex. 4 CBI Then the Model S LR/LR+ can have more than Ex. 4 CBI tested range. In our understanding, EPA will likely run a confirmatory test on that vehicle again. Because of the current COVID-19 situation, how we operate really is affected. From EPA side, do you have an estimated availability from your testing lab? When the earliest EPA can run the confirmatory test?

By the way, any updates on the Model S Long Range Plus FE label release and the final approval? The LR+ data is not posted on the FE website yet. Do you or David have any follow up questions on the explanations?

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

Message

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**From:** Ray Wang [raywang@tesla.com]  
**Sent:** 5/7/2020 3:19:25 AM  
**To:** Rojeck, Tristin [rojeck.tristin@epa.gov]; Suraj Nagaraj [snagaraj@tesla.com]  
**CC:** Wright, DavidA [Wright.DavidA@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]  
**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes  
**Attachments:** TSLA\_L2S\_MY2020\_Model S Long Range Plus battery cell running change request.pdf

Hi Tristin,

Thank you for the response with EPA's point of view about the predominant mode explanation. There is an internal discussion taking place now. We will reach back to you as soon as we land with a conclusion.

Regarding the LR+ running change, please see attached for the running change request letter. It would explain how and why we will submit this running change and recalculate the FE label. On the EV-CIS, the decision information has been submitted along with the test vehicle information and test datasets. Please feel free to contact me if you have any questions.

Thank you

Regards,

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

---

**From:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Sent:** Tuesday, May 5, 2020 6:07 PM  
**To:** Ray Wang <raywang@tesla.com>; Suraj Nagaraj <snagaraj@tesla.com>  
**Cc:** Vineet Mehta <vineet@tesla.com>; Wright, DavidA <Wright.DavidA@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>  
**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hello Ray,

At this time, EPA does not find the Tesla predominant mode explanation acceptable. It is clear that Tesla has at least three sets of Driver Selectable features that affect range and consumption: "Stopping Mode", "Regen Mode", and "Ride Height Mode." Although a mode within one of these features may meet the predominance criteria outlined in CD 09-19 on a given day or over a period of time, it is not clear that the slides provided establish a predominant mode in real world driving.

EPA would expect that a single set of driver selectable regeneration parameters meet the predominance criteria outlined in CD 09-19. Since the "Stopping Mode" and "Regen Mode" affect regenerative braking, it is important that a combination of the modes of these two features meet the predominance criteria. For example, if we simplify each of the features to include an "a" or "b" option, EPA would expect that the predominance criteria would be met for a set of both Driver Selectable features such as "aa." In this case, even if "a" is predominant in each feature, the combination of the two may not meet predominance criteria. I understand that Tesla's logic is much more complex, but further explanations are needed before EPA is comfortable with approving a given set of drive modes.

Next, the road-load implications of the "ride height" feature are not clear to EPA. It is expected that representative road-load forces are applied to certification test vehicles rather than the ideal sets of parameters under ideal conditions. A blended curve (using good engineering judgement with feedback from EPA) of Standard and Low ride heights would be expected for this application especially because a majority of driving across the regulatory cycles



would occur in "Standard" ride height if performed in the real world. Alternatively, EPA is open to the use of a worst case coastdown in standard mode. There has been no predominant ride height mode (Always, Auto, Never) established or even discussed with EPA thus far.

## Ex. 4 CBI

There are ongoing internal EPA discussions on each of these topics and I will be in touch with any clarifications from those discussions.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
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---

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Sent:** Monday, May 4, 2020 6:18 PM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hi Tristin,

Are there any follow up questions on the predominant mode determination presentation? Does EPA accept our justification of the Predominant mode? In this week, there is going to be a LTSLV00.0L2S running change application submitted for the new [Ex. 4 CBI] Model S Long Range Plus. We would like to see the predominant mode case closed before starting a new running change application.

Thank you

**Ray Wang** | Engineer, Homologation

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**T E S L A**

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**From:** Ray Wang

**Sent:** Monday, April 27, 2020 6:50 PM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hi Tristin,

Attached please see the predominant mode determination presentation with page 6 & 7 added for review. The analysis on page 6 can indicate the existing models with Hold mode can meet the predominant mode criteria for Hold mode. Page 7 indicates the analysis of regen modes.

Regarding the cold UDDS test procedure, we can confirm that we have done exactly EPA expected. Please see the overall flow of Cold UDDS below.

- Charge the car to 100% -> unplug the charger -> min 12-hr soak-> UDDS + 10min soak + continuous UDDS until full depletion;
- AC settings: 22C (72F) Auto
- The entire process happens at -7C

Please do not hesitate to ask if you have any questions.

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
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**TESLA**

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**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Sent:** Friday, April 24, 2020 2:07 PM  
**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>  
**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hello Suraj and Ray,

Thank you for the MY21 product plan and meeting minutes from our discussion Tuesday (4/21). I fully understand that the product plan document is subject to change.

In italics below, EPA feedback is embedded in response to each of the summary points provided yesterday:

- **Predominant modes**

- Tesla requested closure of the open issue on driver selectable modes based on new data provided
- EPA is not completely convinced that Tesla meets the requirements of “predominant mode” (particularly the OPD and Regen modes) due to the below arguments.
- Driver selectable mode is not “default” and

## Ex. 4 CBI

- EPA has required that Tesla now begin to formally include this type of information as part of the application submission / pre certification meeting (whichever occurs earlier)

# Ex. 4 CBI

Follow-up – Tesla has not shared with EPA an analysis as outlined in CD-09-19 to determine if the existing Tesla models with Hold mode meet the predominant criteria. Assuming Tesla provides an analysis clearly indicating the existing models with Hold mode meet the predominant mode criteria for hold mode; Tesla then needs to explain to EPA why they believe that the existing predominant mode determinations would apply to the Model S LR+ and Model X LR+.

EPA is not just now placing this requirement on Tesla, this requirement has been in place since manufacturers started offering shift mode options on automatic transmission vehicles. Recent guidance letters (CD-14-19 Certification Application Reporting Guidance Letter dated Nov 24, 2014; and CD-18-10 Compliance Preview Meeting Guidance Letter dated Oct 8, 2018) have included references to CD-09-19 and vehicles equipped with multimode driver selections. Tesla staff must review these guidance letters and seek Agency clarification when they have questions regarding implementing and testing new driver selectable options.

Based on the last bullet in predominant modes, EPA is concerned Tesla currently does not understand the requirements for determining predominant mode for the various driver selectable options and how that determination is made. The requirement is to provide mode information as part of every new vehicle certification submission and more importantly to test the vehicle using the appropriate mode or modes based on the guidance outlined in CD-09-19. It is not appropriate to simply test the vehicle in the most 'efficient' setup, that is not representative, nor does it meet the requirements outlined in Guidance Letter CD-09-19.

To that point, a predominance mode determination should be provided to EPA for review for all driver selectable features/modes that do not latch and affect fuel consumption/range such as regen mode, ride height, active louvers and "Range" modes outlined in slide 2 of the document provided to EPA dated 4/10/2020. Be sure that sample size and duration requirements described in CD 09-19 are met (representative sample of customers over at least one week).

- **New Running change submission.**

## Ex. 4 CBI

- EPA, under its broad administrative privileges under the CFRs, is working on a 5 cycle methodology guidance document. The new guidance document will restrict the number of 20F cold UDDS cycles to be considered for Running FC to 12 and each cycle requires a 10min soak in between.
- EPA requires that all future 5 cycle tests conducted by Tesla use this new methodology instead of the full depletion method, beginning with the upcoming immediate running change.
  - While Tesla appreciates EPA's intention and motivation to provide a standardized testing methodology for all EVs, the number of cycles over which consumption is averaged shouldn't be arbitrary and based on the platform capabilities. Adding a 10 min soak between each cycle is unrepresentative of the real world usage of our vehicles. Tesla will provide more data specific to the LR variant so EPA can make a better judgment call.

As Tesla is in the process of performing 5-cycle testing on the Model S LR+ EPA will withdraw it's request to reduce the number UDDS cycles performed on the 20 F Cold UDDS cycle. EPA expects the 20 F Cold UDDS test to be run according to the Agency's current understanding of the Appendix B document in SAE J1634 which was drafted with Tesla and industry support. The 20 F UDDS test requires the vehicle be fully charged before going into the 20 F cold soak. The vehicle should be soaked at 20 F for a minimum of 12 hours prior to beginning the first UDDS cycle. During the 12-hour soak period the vehicle is not connected to the EVSE, nor is a separate battery charger installed to maintain battery charge, nor is there any thermal conditioning of the battery or the interior of the vehicle. Prior to beginning the test the heater settings are set according to the regulatory requirements. Tesla staff should review EPA guidance letter 2020-04 Climate Control Operation during the Cold Temperature (i.e. Cold CO) Test. There must to be a minimum of a 10-minute soak between the 1<sup>st</sup> and 2<sup>nd</sup> UDDS cycle; following the first soak period, the current Appendix B allows for a 0 to 30 minute soak apply.

EPA is in the process of drafting updated guidance regarding performing the 20 F UDDS testing to support BEV labeling. EPA will share the draft guidance with Tesla staff as it is developed and seek input from Tesla and other EV manufacturers. As Tesla knows the 20 F UDDS data are used in the calculation of the city consumption and not included in the calculation for highway consumption. The vast majority of urban driving is for distances significant less than the 44

*or 51 UDDS cycles that Tesla performed without 10-minute soaks on the Model X LR+ and the Model S LR+. The allowance of greater than 3 or 4 UDDS cycles inappropriately biases the city consumption value, since BEV owners would not drive 300+ urban miles without recharging, as they would have multiple parking events and opportunities to charge. Lastly, looking at the 20 F data Tesla generated, the additional 32 to 39 UDDS cycles only improve the range value by 1.8% to 2.5% which is less than the value EPA considers to be within test to test variability. EPA does not believe this expenditure of resources is worthwhile since it biases the result and provides no meaningful data for the label calculation.*

- **Confirmatory test timeline**

- Tesla requested a new confirmatory test date from the EPA. Tesla intends to bring the running change into production before **Ex. 4 CBI** and would like all certification formalities to be completed before we begin production.
- EPA cannot confirm any date for a new confirmatory test at this point. The earliest possibility may be mid-May depending on their return to work schedule.
- Tesla will continue to work closely with EPA over the next few weeks to schedule a confirmatory test as early as practicable. Tesla intends to begin production of the new running change by **Ex. 4 CBI**

*Tesla needs to resolve the issue of predominance modes and their applicability to the Model S LR+ in addition to completing the 5-cycle testing on the running change configuration; then, Tesla needs to submit the results to EPA. At that time, EPA will make a decision on whether to call-in the running change configuration and determine a test date. At this time the EPA laboratory is shut down due to the Shelter-in-place order issued by Michigan's Governor. The possibility exists that EPA may not be able to perform a confirmatory test on this vehicle. EPA could request Tesla perform confirmatory tests of any of the cycles used to generate the 5-cycle data at Tesla's facility and provide those results to the Agency.*

- **Mileage on FEDV**

- Given the factory shutdown due to COVID-19, Tesla requests EPA to approve use of a vehicle that exceeds the stipulated mileage requirement under the CFRs.
- EPA has no concerns over the FEDV mileage exceedance but will require Tesla to adhere to previously agreed policies over selection of vehicles for testing for all future testing.
- Tesla will provide EPA with details on hardware that remains within the stipulated mileage requirement and what hardware was replaced. In the future, Tesla agreed to limit this deviation for this instance.

*EPA expects the drive system including batteries, electric motor, transaxle, driveshafts, wheels, bearings, and tires to all be replaced and driven or aged to 1,000 miles as a unit.*

Please let me know if you need further clarifications or would like to schedule another meeting to continue the discussion. I hope you all have a good weekend and stay safe!

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

---

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Sent:** Friday, April 24, 2020 12:56 PM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>  
**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hi Tristin,

Attached please see the presentation we shared during the meeting. The roadmaps are according to our current plan. They may still change if there is any change of the business plan.

Thank you

**Ray Wang** | Engineer, Homologation  
901 Page Ave, Fremont, CA 94538  
m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)  
**T E S L A**

---

**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Sent:** Thursday, April 23, 2020 6:52 PM  
**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Cc:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>  
**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hello Suraj,

Thank you for the summary. Could you please provide the presentation from Tuesday when you get a chance? I am particularly interested in the model year 2021 product profile and timeline if the whole presentation isn't available yet.

I will reach out with EPA feedback in the near future.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
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---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Thursday, April 23, 2020 1:00 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

Cc: Ray Wang <raywang@tesla.com>; Vineet Mehta <vineet@tesla.com>

Subject: Tesla- EPA call (April 20 2020) - Minutes

D Wright , Tristin, D.Good, Linc,

Thank you all for joining the call with us on Monday. Here are some notes on the topics of discussion and the action items on our end. Please review and let me know if you disagree with anything stated below.

Topics of Discussion	Follow up
<ul style="list-style-type: none"><li>• <b>Predominant modes</b><ul style="list-style-type: none"><li>○ Tesla requested closure of the open issue on driver selectable modes based on new data provided</li><li>• EPA is not completely convinced that Tesla meets the requirements of “predominant mode” (particularly the OPD and Regen modes) due to the below arguments.<ul style="list-style-type: none"><li>• Driver selectable mode is not “default” and</li></ul></li></ul></li></ul> <div>Ex. 4 CBI</div> <ul style="list-style-type: none"><li>• EPA has required that Tesla now begin to formally include this type of information as part of the application submission / pre certification meeting (whichever occurs earlier)</li></ul> <div>Ex. 4 CBI</div>	
<ul style="list-style-type: none"><li>• <b>New Running change submission.</b></li></ul> <div>Ex. 4 CBI</div> <ul style="list-style-type: none"><li>• EPA , under its broad administrative privileges under the CFRs, is working on a 5 cycle methodology guidance document. The new guidance document will restrict the number of 20F cold UDDS cycles to be considered for Running FC to 12 and each cycle requires a 10min soak in between.</li><li>• EPA requires that all future 5 cycle tests conducted by Tesla use this new methodology instead of the full depletion method, beginning with the upcoming immediate running change.<ul style="list-style-type: none"><li>○ While Tesla appreciates EPA’s intention and motivation to provide a standardized testing methodology for all EVs, the number of cycles over which consumption is averaged shouldn’t be arbitrary and based on the platform capabilities. Adding a 10 min soak between each cycle is unrepresentative of the</li></ul></li></ul>	

<p>real world usage of our vehicles. Tesla will provide more data specific to the LR variant so EPA can make a better judgment call.</p>	
<ul style="list-style-type: none"> <li>• <b>Confirmatory test timeline</b> <ul style="list-style-type: none"> <li>○ Tesla requested a new confirmatory test date from the EPA. Tesla intends to bring the running change into production before <b>Ex. 4 CBI</b> and would like all certification formalities to be completed before we begin production.</li> </ul> </li> <li>• EPA cannot confirm any date for a new confirmatory test at this point. The earliest possibility may be mid-May depending on their return to work schedule.</li> <li>○ Tesla will continue to work closely with EPA over the next few weeks to schedule a confirmatory test as early as practicable. Tesla intends to begin production of the new running change by <b>Ex. 4 CBI</b></li> </ul>	
<ul style="list-style-type: none"> <li>• <b>Mileage on FEDV</b> <ul style="list-style-type: none"> <li>○ Given the factory shutdown due to COVID-19, Tesla requests EPA to approve use of a vehicle that exceeds the stipulated mileage requirement under the CFRs.</li> </ul> </li> <li>• EPA has no concerns over the FEDV mileage exceedance but will require Tesla to adhere to previously agreed policies over selection of vehicles for testing for all future testing.</li> <li>○ Tesla will provide EPA with details on hardware that remains within the stipulated mileage requirement and what hardware was replaced. In the future , Tesla agreed to limit this deviation for this instance.</li> </ul>	<ul style="list-style-type: none"> <li>○</li> </ul>

Suraj Nagaraj | Director, Homologation

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**T E S L A**

Message

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**From:** Rojeck, Tristin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BE24F2B3500C4142B4FA5DBCC7F88EE6-ROJECK, TRI]  
**Sent:** 3/12/2021 7:35:35 PM  
**To:** Suraj Nagaraj [snagaraj@tesla.com]; Ray Wang [raywang@tesla.com]  
**CC:** Wright, DavidA [Wright.DavidA@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]; Snyder, Jim [Snyder.Jim@epa.gov]  
**Subject:** RE: Confirmatory Test Timeline and Test Vehicle Information

Hello Suraj,

I appreciate the test and maintenance logs for the data vehicles currently in the process of EPA confirmatory testing. I have a few follow-up questions about Tesla's testing practices, vehicle maintenance and the 12V battery operation:

Testing:

1. What is a derivation check? Is this a coastdown quick-check or a re-derivation?
  - a. Please provide Tesla's written procedure for this check. If Tesla does not have a written procedure for this check, please provide an explanation of this process.
  - b. Please provide the Agency with the results of all derivation checks performed on each fuel economy data vehicle (FEDV).
2. Please provide the set and target coefficients for each derivation on each FEDV with the date/time that they were performed.
  - a. Please provide Tesla's written procedure for performing road load derivations.
3. Can you please explain the **Ex. 4 CBI**

**Ex. 4 CBI**

- i. Please provide the results of the rejected tests to the Agency.
  - c. Why was a derivation check completed after a rejected test?
  4. What is the drive cycle used for whole vehicle mileage accumulation?
    - a. Standard Road Cycle, MCT, other?

Maintenance:

1. Did the wheel alignment activity result in alteration of the alignment for the MS LR or other vehicles?
2. Why was refrigerant replaced at ~2300 miles on the MS LR FEDV?
  - a. Is this common practice or maintenance recommended to the customer?

12V Battery:

1. Does UI mean 'user interface'?
  - a. If not, what does UI mean?
2. Why wasn't the **Ex. 4 CBI** factory default on this vehicle?
  - a. How does the FEDV differ from other production vehicles?

Thank you for offering to have a Tesla service representative available, but this will not be an acceptable practice. If the vehicle is not able to complete the confirmatory test process without intervention, the test will be deemed invalid. I would like to restate that the EPA confirmatory process is not a development environment. Please make certain that vehicles are tested internally and delivered to EPA with production representative hardware and software to ensure that we don't continue to have these issues.

Have a nice weekend!

Regards,

Tristin Rojeck



Light-Duty Vehicle Center - Compliance Division  
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(734) 214-4649

---

**From:** Suraj Nagaraj <snagaraj@tesla.com>  
**Sent:** Thursday, March 11, 2021 10:54 AM  
**To:** Rojeck, Tristin <rojeck.tristin@epa.gov>; Ray Wang <raywang@tesla.com>  
**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>  
**Subject:** RE: Confirmatory Test Timeline and Test Vehicle Information

Hello Tristin.

My apologies for the delay in getting our responses to you. Here is the background on 12V issue faced on this car. I'll also attached the maintenance and test logs from the three FEDVs.

#### Background

Upon further investigation of the test logs, the original LV battery for the MS LR FEDV has been determined to be in good condition and can be simply reinstalled within the vehicle.

In the LR confirmatory test attempt, EPA's test laboratory was actually able to bring the car to the charger quickly enough, such that the LV battery did not discharge itself beyond its disconnection threshold. The MOSFET never opened as the LV battery was at ~50% SoC.

Ex. 4 CBI

Ex. 4 CBI

Upon reading a low charge current

after about an hour of charging, Arlene called Chris to help troubleshoot.

Ex. 4 CBI

**Ex. 4 CBI**

#### Next Steps.

As noted above, The 12V battery that was originally shipped with MS LR FEDV has been determined to be in good condition and can be simply reinstalled within the vehicle. However, In order to prevent the full recharge from being disrupted by the

Ex. 4 CBI

Ex. 4 CBI

This can be done either remotely or locally connecting to the car computer and run a command to set the config to enable the watchdog reset behavior (Similar to the process to lock the suspension). This state **Ex. 4 CBI** does not actively change the energy consumption of the vehicle neither during the full discharge nor during the full recharge event, and is representative of the state of the vehicle at Delivery.

As discussed, the behavior of the LV battery to protect and disconnect itself will be experienced by our customers. We would recommend that, just as achieved during the previous test attempt, your laboratory move the vehicle to the charge as quickly after the end of drive condition is reached so as to prevent the LV battery from disconnecting and requiring a service intervention from Tesla. We are also willing to have a service representative on standby during the upcoming test attempt to support the quick reconnection of the battery for the full recharge to commence.

Suraj

---

**From:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Sent:** Wednesday, March 10, 2021 6:03 AM  
**To:** Ray Wang <raywang@tesla.com>  
**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>; Suraj Nagaraj <snagaraj@tesla.com>; Wehrly, Linc

<wehrly.linc@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>

**Subject:** RE: Confirmatory Test Timeline and Test Vehicle Information

Hello Ray,

At this time, the decision has been made that we are not going to be able to complete testing on either of the vehicles scheduled to test this week. I will be in touch once test dates are officially rescheduled. Below is a statement from the EPA lab team on this subject:

“Due to exposure from an individual who developed COVID symptoms late last week, we have taken LD certification sites D006 and D329 out of service for 7 days each. We anticipate only limited certification testing capability this week, but plan to resume with the previous throughput next week.”

The current expected timeline is that we will prep the 2021 Tesla Model S Long Range on Friday, March 19<sup>th</sup> (prep Thursday 3/18). I will coordinate with Chris Tacub to schedule a time to lock the suspension prior to testing. I still do not have information or instructions about special considerations that are necessary for re-installing the original 12V battery. Is that something that can be provided today or tomorrow? I am hoping that I will have an update on the Model Y Long Range AWD by Thursday.

Also, do you have any update on when Tesla can respond to the questions from Friday?

Thanks,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

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**From:** Rojeck, Tristin

**Sent:** Friday, March 5, 2021 3:49 PM

**To:** Ray Wang <raywang@tesla.com>

**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>; Suraj Nagaraj <snagaraj@tesla.com>; Wehrly, Linc <wehrly.linc@epa.gov>; Snyder, Jim <Snyder.Jim@epa.gov>

**Subject:** Confirmatory Test Timeline and Test Vehicle Information

Hello Ray,

The current testing timeline for the Tesla vehicles at EPA is that the Model Y Long Range will prep Monday/test Tuesday next week then the Model S Long Range will prep Wednesday/test Thursday. However, these dates are subject to change. I recently was alerted that someone that was at the EPA lab this week may have COVID-19, so it is possible that our lab will be shut down next week pending the COVID-19 test results. This is also important because it may impact Chris' travels to Ann Arbor. I should know more early on Monday. Either way, I was hoping that we could receive instructions as to how to reconnect the 12V battery for the MS LR by the end of today, if possible.

Also, I would like to request some additional information on the test vehicles currently at EPA:

1. Model 3 AWD (VID: 3D321-845394)
2. Model Y AWD (VID: YD321-067045 )
3. Model S Long Range (VID: SD321-419989 )

Could you please provide the maintenance logs and vehicle selection information for each of these vehicles? Basically, I am looking for any vehicle updates, unscheduled maintenance or part replacements from the time of vehicle selection at 0 miles to the time the vehicle was delivered to EPA. In addition, could you please provide records of tests started that were ultimately determined to be void for whatever reason during the 2021 Model Year? If you have the reason for void and how far into the test it was voided that would be helpful, as well.

I will keep you updated as I hear more about our lab operations next week. Have a nice weekend!

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

Message

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**From:** Rojeck, Tristin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BE24F2B3500C4142B4FA5DBCC7F88EE6-ROJECK, TRI]  
**Sent:** 3/18/2021 8:53:18 PM  
**To:** Ray Wang [raywang@tesla.com]  
**CC:** Wright, DavidA [Wright.DavidA@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]; Suraj Nagaraj [snagaraj@tesla.com]; Bunker, Byron [bunker.byron@epa.gov]  
**Subject:** RE: 2021 Tesla Model S Long Range  
**Attachments:** 2021-02-09-MDLG-1596\_GR-MS\_LR\_pack\_selection.pptx; Tesla August Cell Data For EPA.pptx; MS 419989 Tests and Maintenance.Pdf

Hello Ray,

These questions are very helpful and important. Below are EPA responses to each question:

## Ex. 4 CBI

- a. Please provide an updated cell lot dataset (similar to the dataset provided for SD321-419989) and where the new battery pack lies within the dataset.
  - i. Yes, email is acceptable. I will confirm, via email, the EPA disposition on if the battery pack is acceptable.
  - ii. For reference, attached is an example of the cell lot dataset provided for SD321-419989.
- b. In addition, EPA requests that Tesla provide the cell lot capacity distribution in monthly reports for the Model Year 2021 Model S Long Range.
  - i. An example of the cell data summary from August 2020 for the 20MY Model S Long Range Plus is included for reference, but EPA will also expect the individual cell capacities in a .zip file as provided in the past.

## Ex. 4 CBI

- a. The current plan is acceptable. Thank you for the clarification on the VIN randomization.
- b. Please inform the Agency if any vehicle updates, wheel alignments or unscheduled maintenances occur on the data vehicle.
- c. When the tests are submitted in a CTDI (waiver) request, please provide a similar log to that provided for the vehicles currently at EPA with the vehicle derivation/testing log and maintenance/mileage accumulation log.
- i. For reference, attached is an example of the logs provided for SD321-419989.

The lack of support for testing SD321-419989 is disappointing. The reason that EPA had planned to complete this experimental testing was to evaluate the Tesla hypothesis that the air-suspension impacted loads experienced by vehicles during previous testing at NVFEL. At this time, we have not updated the 2021 Model S Long Range Plus on FuelEconomy.gov due to that we have not had a chance to substantiate the ride-height/air-suspension claim. Without further testing, EPA will consider the matter closed and the MS LR+ dataset will be uploaded with the next scheduled release (3/23).

Please let me know if you have any further questions on the topics discussed.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division

Office of Transportation and Air Quality

U.S. Environmental Protection Agency

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**From:** Ray Wang <raywang@tesla.com>  
**Sent:** Wednesday, March 17, 2021 8:00 PM  
**To:** Rojeck, Tristin <rojeck.tristin@epa.gov>  
**Subject:** RE: 2021 Tesla Model S Long Range

Hi Tristin,

**Ex. 4 CBI**

Let me know if you have any questions.

Regards,  
Ray Wang

Sr Homologation Engineer  
901 Page Ave, Fremont, CA 94538  
E. [raywang@tesla.com](mailto:raywang@tesla.com) T. (612) 940-3608

T E S L A

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**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Sent:** Wednesday, March 17, 2021 1:48 PM  
**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Bunker, Byron <bunker.byron@epa.gov>; Suraj Nagaraj <snagaraj@tesla.com>

**Subject:** RE: 2021 Tesla Model S Long Range

Hello Ray,

I appreciate the call earlier requesting clarification on 5-cycle testing. As we discussed, EPA expects all fuel economy testing to be completed on the new Model S Long Range FEDV after mileage accumulation. This includes 5-cycle testing. Could you please provide Tesla's battery and vehicle selection process/criteria? It sounded like the vehicle is planned to be the next Model S Long Range off the production line and the battery pack is planned to be selected in accordance with §86.1830-01(a)(2). This sounds reasonable, but please confirm the details when you get a chance.

I will follow up later today or early tomorrow regarding the Model 3 LR AWD. Also, do you have any update on the ability to lock the air-suspension and update the **Ex. 4 CBI** remotely for SD321-419989?

Thanks,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division

Office of Transportation and Air Quality

U.S. Environmental Protection Agency

(734) 214-4649

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**From:** Rojeck, Tristin

**Sent:** Wednesday, March 17, 2021 1:34 PM

**To:** 'Suraj Nagaraj' <snagaraj@tesla.com>

**Cc:** Wright, DavidA <Wright.DavidA@epa.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Bunker, Byron <bunker.byron@epa.gov>; Davis, Julian <davis.julian@epa.gov>; Ray Wang <raywang@tesla.com>

**Subject:** 2021 Tesla Model S Long Range

Hello Suraj,

The practice of installing a replacement battery or swapping a battery on a Fuel Economy Data Vehicle (FEDV) is a significant issue. After consultation with our in-house legal counsel and discussions with Byron, it has been determined by EPA that J1634 is incorporated by reference only for application to the regulations in 40 CFR §600.116-12(a) and §600.311-12(j)-(k) which describe vehicle test procedures and fuel economy calculations. The regulations that speak to vehicle acceptability and mileage accumulation are §600.007 and 40 CFR §86.1831-01. Based on this determination, the Model S Long Range FEDV (VID: SD321-419989 / 0) has been deemed unrepresentative for fuel economy labeling purposes due to improper mileage accumulation on the data vehicle.

Please select a new Model S Long Range FEDV then complete vehicle aging and testing pursuant to EPA regulations. EPA's expectation is that Tesla uses a regulatorily described method for selecting components for a data vehicle (§86.1830-01(a)(2)). Next, the vehicle, in its entirety (including the production representative battery pack), should be driven over a minimum of 2,000 miles of mileage accumulation cycles (unless Tesla has analysis demonstrating stabilization of the vehicle in terms of consumption and range between 1000-2000 miles consistent with the allowance

in §86.1831-01(c)). Please communicate with EPA prior to the component/vehicle selection and mileage accumulation processes to confirm alignment on each topic.

In parallel, EPA is planning to perform experimental testing on the Model S Long Range (VID: SD321-419989) currently in EPA possession. The anticipated timeline is to complete a road-load derivation on Thursday (3/18) and complete an MCT on Friday (3/19). This experimental testing will be used to evaluate the impact of ride-height/air-suspension on the road load force and dynamometer set coefficients compared to the void test from February. This will not be an official test.

Would it be possible for Tesla to push software over-the-air to lock the suspension of the Model S Long Range (VID: SD321-419989)? In addition, if the **Ex. 4 CBI** has been deemed production representative, could this also be updated remotely? We are open to a Tesla representative installing the software onsite, but this would need to occur early tomorrow morning (3/18). EPA plans to reconnect the original 12V battery into the vehicle tomorrow morning prior to the RLD and prep activity. Could you please tell me the current SOC of the HV battery pack for the MS LR (VID: SD321-419989)? I would like to ensure that the vehicle is currently in or near the acceptable SOC range (50-70%) for road-load derivations.

Please let me know if you need any clarifications on these requests.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division

Office of Transportation and Air Quality

U.S. Environmental Protection Agency

(734) 214-4649

Message

**From:** Rojeck, Tristin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BE24F2B3500C4142B4FA5DBCC7F88EE6-ROJECK, TRI]  
**Sent:** 5/19/2020 9:34:50 PM  
**To:** Suraj Nagaraj [snagaraj@tesla.com]; Ray Wang [raywang@tesla.com]  
**CC:** Vineet Mehta [vineet@tesla.com]; Wright, DavidA [Wright.DavidA@epa.gov]; Wehrly, Linc [wehrly.linc@epa.gov]  
**Subject:** RE: Tesla- EPA call (April 20 2020) - Tesla Response (May 13 2020)

Hello Suraj,

Thank you for setting up the Microsoft Teams meeting for tomorrow.

From the EPA perspective, Tesla is the first manufacturer that is utilizing multiple mode selections to affect a single function, i.e. the regeneration performance of a BEV. To provide some background, at the time CD 09-19 was developed, vehicle manufacturers were implementing a unique set of modes for transmission shifting: semi-automatic, eco, and sport, for example, were modes designed to modify the operation of the transmission. With respect to other vehicles, most manufacturers do not provide owners with a multiplicity of mode options that can be selected independently. EPA recommends that manufacturers disclose to the Agency the various driver selectable modes that will be offered on their products with a description of the functionality of those modes.

As noted, EPA has not encountered any mode selection routine similar to the Tesla product line. It has recently come to our attention that this feature set was implemented as early as the 2019 MY and the assumptions, with regards to predominance, were being included in the Tesla range testing prior to providing descriptions of these modes to EPA. EPA staff have discussed the implications of Tesla having two unique mode selections which impact the regeneration performance of a vehicle. As we read CD-09-19, we do not feel that it is appropriate to consider the Regen and Stopping mode selections independently since these modes collectively impact the amount of vehicle regeneration.

Additionally, could you please clarify what the tables and plots depict in the predominant mode document. Is the snapshot of the real world data (seen below) a weighted average of the entire sample period or the final day of the sample period?

**Ex. 4 CBI**

The implementation of start-stop technology on vehicles with ICE engines is one example of a situation where EPA does not allow manufacturers to test vehicles with the feature enabled unless this is the 'default' mode for the selection, i.e. after a key off event, even if the feature had been disabled on a prior drive, the feature would revert to the 'default' setting and start-stop would be active on the next drive, unless and until the driver disabled it again. For manufacturers which have a latching start-stop disable switch, EPA considers that switch to be a unique mode compared to the other modes. This is the same logic we are applying to Tesla. An ECO mode for transmission shifting generally does not alter vehicle activity when the vehicle is at a stop and the engine is either allowed to idle or not. If a manufacturer had two modes that could be selected independently which would affect transmission shifting in unique ways, these modes would be considered in a combined manner and not independently.

Moving on to the ride height portion of the discussion, according to Tesla, the Model S has 4 unique ride height settings: low, standard, high, and very high. Tesla Model S owners have three non-latching options for setting the vehicle ride height: Always, Auto, and Never. Tesla has provided information which suggests that Auto is the predominant mode.

According to Tesla, when the vehicle is in Auto mode, the ride height is at standard height if the vehicle speed is **Ex. 4 CBI**

**Ex. 4 CBI**



# Ex. 4 CBI

I look forward to continuing our discussion tomorrow.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
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---

**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Sent:** Wednesday, May 13, 2020 6:36 PM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>  
**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>  
**Subject:** RE: Tesla- EPA call (April 20 2020) - Tesla Response (May 13 2020)  
**Importance:** High

Hi Tristin,  
Please see our response below. Happy to connect over the phone and provide more context if required.  
Suraj

---

**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Sent:** Tuesday, May 5, 2020 6:07 PM  
**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>  
**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hello Ray,

At this time, EPA does not find the Tesla predominant mode explanation acceptable. It is clear that Tesla has at least three sets of Driver Selectable features that affect range and consumption: "Stopping Mode", "Regen Mode", and "Ride Height Mode." Although a mode within one of these features may meet the predominance criteria outlined in CD 09-19 on a given day or over a period of time, it is not clear that the slides provided establish a predominant mode in real world driving.

<Tesla 5/13>>. The data supplied on slides 6 & 7 of the presentation titled "2020-04-10 EPA Modes Request Follow-Up#2\_April272020\_Ray.pptx" is the latest version of the document EPA should be referencing here. I am reattaching the three slides (HOLD, REGEN and RIDE HEIGHT) showing all the predominant modes along with real world data that Tesla has relied on to determine the predominance of each of these modes. .

# Ex. 4 CBI

## Ex. 4 CBI

EPA would expect that a single set of driver selectable regeneration parameters meet the predominance criteria outlined in CD 09-19. Since the "Stopping Mode" and "Regen Mode" affect regenerative braking, it is important that a combination of the modes of these two features meet the predominance criteria. For example, if we simplify each of the features to include an "a" or "b" option, EPA would expect that the predominance criteria would be met for a set of both Driver Selectable features such as "aa." In this case, even if "a" is predominant in each feature, the combination of the two may not meet predominance criteria. I understand that Tesla's logic is much more complex, but further explanations are needed before EPA is comfortable with approving a given set of drive modes.

*<<Tesla 5/13>> . In our read of the requirements contained within CD-09-19 , it's clear that there is no specific language that requires us to use a combination of driving modes when determining predominant mode. The very fact that the language states "mode" instead of "modes" leads us to believe that the intent was to look at each driver selectable mode individually. Even if two driver selectable modes affect one aspect of the range/Energy consumption, it's important to note that they may affect that aspect in different ways. That's one of the reasons why they are different settings on the UI. If both selections did the same function, why even have two separate selectable modes? What EPA is suggesting may be relevant purely from an academic standpoint but its neither practical nor in the spirit of the regulation for us to look at a combination of these modes when determining the predominant mode. We don't believe EPA requires every conventional ICE vehicle manufacturer to consider combining driving modes when determining predominant modes. For example, if a car has both a "Start-stop" mode and a "ECO" mode, does EPA require the OEM to consider both modes to be the same just because they affect the overall fuel economy of the vehicle?*

Next, the road-load implications of the "ride height" feature are not clear to EPA. It is expected that representative road-load forces are applied to certification test vehicles rather than the ideal sets of parameters under ideal conditions. A blended curve (using good engineering judgement with feedback from EPA) of Standard and Low ride heights would be expected for this application especially because a majority of driving across the regulatory cycles would occur in "Standard" ride height if performed in the real world. *Vehicle speed is greater than 64mph for 90s.* Alternatively, EPA is open to the use of a worst case coastdown in standard mode. There has been no predominant ride height mode (Always, Auto, Never) established or even discussed with EPA thus far.

## Ex. 4 CBI

*Tesla's ride height state machine identifies high speed driving and brings the vehicle to the "Low" ride height setting to reduce aerodynamic drag and improve consumption. Chassis dynamometers take in static polynomial road-load inputs and cannot dynamically switch the road-load curve based on the vehicle speed or otherwise mimic our state machine behavior; such a dynamic application of road-load curves to mimic active aerodynamic effects would provide a more representative simulation of road-load forces.*

## Ex. 4 CBI

# Ex. 4 CBI

## Ex. 4 CBI

Pursuant to the running change requirements of § 40 CFR 600.507-12-(b), (2), (iv), Tesla determined that a recalculate the FE label per § 40 CFR 600.314-08 is allowed.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
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---

**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Sent:** Monday, May 4, 2020 6:18 PM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hi Tristin,

Are there any follow up questions on the predominant mode determination presentation? Does EPA accept our justification of the Predominant mode? In this week, there is going to be a LTSLV00.0L2S running change application submitted for the new **Ex. 4 CBI** Model S Long Range Plus. We would like to see the predominant mode case closed before starting a new running change application.

Thank you

**Ray Wang** | Engineer, Homologation

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**T E S L A**

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**From:** Ray Wang

**Sent:** Monday, April 27, 2020 6:50 PM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hi Tristin,

Attached please see the predominant mode determination presentation with page 6 & 7 added for review. The analysis on page 6 can indicate the existing models with Hold mode can meet the predominant mode criteria for Hold mode. Page 7 indicates the analysis of regen modes.

Regarding the cold UDDS test procedure, we can confirm that we have done exactly EPA expected. Please see the overall flow of Cold UDDS below.

- Charge the car to 100% -> unplug the charger -> min 12-hr soak-> UDDS + 10min soak + continuous UDDS until full depletion;
- AC settings: 22C (72F) Auto
- The entire process happens at -7C

Please do not hesitate to ask if you have any questions.

Thank you

**Ray Wang** | Engineer, Homologation  
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**TESLA**

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**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Sent:** Friday, April 24, 2020 2:07 PM  
**To:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>  
**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hello Suraj and Ray,

Thank you for the MY21 product plan and meeting minutes from our discussion Tuesday (4/21). I fully understand that the product plan document is subject to change.

In italics below, EPA feedback is embedded in response to each of the summary points provided yesterday:

- **Predominant modes**

- Tesla requested closure of the open issue on driver selectable modes based on new data provided
- EPA is not completely convinced that Tesla meets the requirements of “predominant mode” (particularly the OPD and Regen modes) due to the below arguments.
- Driver selectable mode is not “default” and

## Ex. 4 CBI

- EPA has required that Tesla now begin to formally include this type of information as part of the application submission / pre certification meeting (whichever occurs earlier)

# Ex. 4 CBI

Follow-up – Tesla has not shared with EPA an analysis as outlined in CD-09-19 to determine if the existing Tesla models with Hold mode meet the predominant criteria. Assuming Tesla provides an analysis clearly indicating the existing models with Hold mode meet the predominant mode criteria for hold mode; Tesla then needs to explain to EPA why they believe that the existing predominant mode determinations would apply to the Model S LR+ and Model X LR+.

EPA is not just now placing this requirement on Tesla, this requirement has been in place since manufacturers started offering shift mode options on automatic transmission vehicles. Recent guidance letters (CD-14-19 Certification Application Reporting Guidance Letter dated Nov 24, 2014; and CD-18-10 Compliance Preview Meeting Guidance Letter dated Oct 8, 2018) have included references to CD-09-19 and vehicles equipped with multimode driver selections. Tesla staff must review these guidance letters and seek Agency clarification when they have questions regarding implementing and testing new driver selectable options.

Based on the last bullet in predominant modes, EPA is concerned Tesla currently does not understand the requirements for determining predominant mode for the various driver selectable options and how that determination is made. The requirement is to provide mode information as part of every new vehicle certification submission and more importantly to test the vehicle using the appropriate mode or modes based on the guidance outlined in CD-09-19. It is not appropriate to simply test the vehicle in the most 'efficient' setup, that is not representative, nor does it meet the requirements outlined in Guidance Letter CD-09-19.

To that point, a predominance mode determination should be provided to EPA for review for all driver selectable features/modes that do not latch and affect fuel consumption/range such as regen mode, ride height, active louvers and "Range" modes outlined in slide 2 of the document provided to EPA dated 4/10/2020. Be sure that sample size and duration requirements described in CD 09-19 are met (representative sample of customers over at least one week).

- **New Running change submission.**

## Ex. 4 CBI

- EPA , under its broad administrative privileges under the CFRs, is working on a 5 cycle methodology guidance document. The new guidance document will restrict the number of 20F cold UDDS cycles to be considered for Running FC to 12 and each cycle requires a 10min soak in between.
- EPA requires that all future 5 cycle tests conducted by Tesla use this new methodology instead of the full depletion method, beginning with the upcoming immediate running change.
  - While Tesla appreciates EPA's intention and motivation to provide a standardized testing methodology for all EVs, the number of cycles over which consumption is averaged shouldn't be arbitrary and based on the platform capabilities. Adding a 10 min soak between each cycle is unrepresentative of the real world usage of our vehicles. Tesla will provide more data specific to the LR variant so EPA can make a better judgment call.

As Tesla is in the process of performing 5-cycle testing on the Model S LR+ EPA will withdraw it's request to reduce the number UDDS cycles performed on the 20 F Cold UDDS cycle. EPA expects the 20 F Cold UDDS test to be run according to the Agency's current understanding of the Appendix B document in SAE J1634 which was drafted with Tesla and industry support. The 20 F UDDS test requires the vehicle be fully charged before going into the 20 F cold soak. The vehicle should be soaked at 20 F for a minimum of 12 hours prior to beginning the first UDDS cycle. During the 12-hour soak period the vehicle is not connected to the EVSE, nor is a separate battery charger installed to maintain battery charge, nor is there any thermal conditioning of the battery or the interior of the vehicle. Prior to beginning the test the heater settings are set according to the regulatory requirements. Tesla staff should review EPA guidance letter 2020-04 Climate Control Operation during the Cold Temperature (i.e. Cold CO) Test. There must to be a minimum of a 10-minute soak between the 1<sup>st</sup> and 2<sup>nd</sup> UDDS cycle; following the first soak period, the current Appendix B allows for a 0 to 30 minute soak apply.

EPA is in the process of drafting updated guidance regarding performing the 20 F UDDS testing to support BEV labeling. EPA will share the draft guidance with Tesla staff as it is developed and seek input from Tesla and other EV manufacturers. As Tesla knows the 20 F UDDS data are used in the calculation of the city consumption and not included in the calculation for highway consumption. The vast majority of urban driving is for distances significant less than the 44

or 51 UDDS cycles that Tesla performed without 10-minute soaks on the Model X LR+ and the Model S LR+. The allowance of greater than 3 or 4 UDDS cycles inappropriately biases the city consumption value, since BEV owners would not drive 300+ urban miles without recharging, as they would have multiple parking events and opportunities to charge. Lastly, looking at the 20 F data Tesla generated, the additional 32 to 39 UDDS cycles only improve the range value by 1.8% to 2.5% which is less than the value EPA considers to be within test to test variability. EPA does not believe this expenditure of resources is worthwhile since it biases the result and provides no meaningful data for the label calculation.

- **Confirmatory test timeline**

- Tesla requested a new confirmatory test date from the EPA. Tesla intends to bring the running change into production before **Ex. 4 CBI** and would like all certification formalities to be completed before we begin production.
- EPA cannot confirm any date for a new confirmatory test at this point. The earliest possibility may be mid-May depending on their return to work schedule.
- Tesla will continue to work closely with EPA over the next few weeks to schedule a confirmatory test as early as practicable. Tesla intends to begin production of the new running change by **Ex. 4 CBI**

*Tesla needs to resolve the issue of predominance modes and their applicability to the Model S LR+ in addition to completing the 5-cycle testing on the running change configuration; then, Tesla needs to submit the results to EPA. At that time, EPA will make a decision on whether to call-in the running change configuration and determine a test date. At this time the EPA laboratory is shut down due to the Shelter-in-place order issued by Michigan's Governor. The possibility exists that EPA may not be able to perform a confirmatory test on this vehicle. EPA could request Tesla perform confirmatory tests of any of the cycles used to generate the 5-cycle data at Tesla's facility and provide those results to the Agency.*

- **Mileage on FEDV**

- Given the factory shutdown due to COVID-19, Tesla requests EPA to approve use of a vehicle that exceeds the stipulated mileage requirement under the CFRs.
- EPA has no concerns over the FEDV mileage exceedance but will require Tesla to adhere to previously agreed policies over selection of vehicles for testing for all future testing.
- Tesla will provide EPA with details on hardware that remains within the stipulated mileage requirement and what hardware was replaced. In the future, Tesla agreed to limit this deviation for this instance.

*EPA expects the drive system including batteries, electric motor, transaxle, driveshafts, wheels, bearings, and tires to all be replaced and driven or aged to 1,000 miles as a unit.*

Please let me know if you need further clarifications or would like to schedule another meeting to continue the discussion. I hope you all have a good weekend and stay safe!

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

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**From:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>

**Sent:** Friday, April 24, 2020 12:56 PM

**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hi Tristin,

Attached please see the presentation we shared during the meeting. The roadmaps are according to our current plan. They may still change if there is any change of the business plan.

Thank you

**Ray Wang** | Engineer, Homologation

901 Page Ave, Fremont, CA 94538

m. +1 (612) 940-3608 | [raywang@tesla.com](mailto:raywang@tesla.com)

**T E S L A**

---

**From:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Sent:** Thursday, April 23, 2020 6:52 PM

**To:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Cc:** Ray Wang <[raywang@tesla.com](mailto:raywang@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

**Subject:** RE: Tesla- EPA call (April 20 2020) - Minutes

Hello Suraj,

Thank you for the summary. Could you please provide the presentation from Tuesday when you get a chance? I am particularly interested in the model year 2021 product profile and timeline if the whole presentation isn't available yet.

I will reach out with EPA feedback in the near future.

Regards,

Tristin Rojeck

Light-Duty Vehicle Center - Compliance Division

Office of Transportation and Air Quality

U.S. Environmental Protection Agency

(734) 214-4649

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**From:** Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Sent:** Thursday, April 23, 2020 1:00 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>; Wehrly, Linc <[wehrly.linc@epa.gov](mailto:wehrly.linc@epa.gov)>

Cc: Ray Wang <raywang@tesla.com>; Vineet Mehta <vineet@tesla.com>

Subject: Tesla- EPA call (April 20 2020) - Minutes

D Wright , Tristin, D.Good, Linc,

Thank you all for joining the call with us on Monday. Here are some notes on the topics of discussion and the action items on our end. Please review and let me know if you disagree with anything stated below.

Topics of Discussion	Follow up
<ul style="list-style-type: none"><li>• <b>Predominant modes</b><ul style="list-style-type: none"><li>○ Tesla requested closure of the open issue on driver selectable modes based on new data provided</li><li>• EPA is not completely convinced that Tesla meets the requirements of “predominant mode” (particularly the OPD and Regen modes) due to the below arguments.<ul style="list-style-type: none"><li>• Driver selectable mode is not “default” and</li></ul></li></ul></li></ul> <div>Ex. 4 CBI</div> <ul style="list-style-type: none"><li>• EPA has required that Tesla now begin to formally include this type of information as part of the application submission / pre certification meeting (whichever occurs earlier)</li></ul> <div>Ex. 4 CBI</div>	
<ul style="list-style-type: none"><li>• <b>New Running change submission.</b></li></ul> <div>Ex. 4 CBI</div> <ul style="list-style-type: none"><li>• EPA , under its broad administrative privileges under the CFRs, is working on a 5 cycle methodology guidance document. The new guidance document will restrict the number of 20F cold UDDS cycles to be considered for Running FC to 12 and each cycle requires a 10min soak in between.</li><li>• EPA requires that all future 5 cycle tests conducted by Tesla use this new methodology instead of the full depletion method, beginning with the upcoming immediate running change.<ul style="list-style-type: none"><li>○ While Tesla appreciates EPA’s intention and motivation to provide a standardized testing methodology for all EVs, the number of cycles over which consumption is averaged shouldn’t be arbitrary and based on the platform capabilities. Adding a 10 min soak between each cycle is unrepresentative of the</li></ul></li></ul>	



<p>real world usage of our vehicles. Tesla will provide more data specific to the LR variant so EPA can make a better judgment call.</p>	
<ul style="list-style-type: none"> <li>• <b>Confirmatory test timeline</b> <ul style="list-style-type: none"> <li>○ Tesla requested a new confirmatory test date from the EPA. Tesla intends to bring the running change into production before <b>Ex. 4 CBI</b> and would like all certification formalities to be completed before we begin production.</li> </ul> </li> <li>• EPA cannot confirm any date for a new confirmatory test at this point. The earliest possibility may be mid-May depending on their return to work schedule.</li> <li>○ Tesla will continue to work closely with EPA over the next few weeks to schedule a confirmatory test as early as practicable. Tesla intends to begin production of the new running change by <b>Ex. 4 CBI</b></li> </ul>	
<ul style="list-style-type: none"> <li>• <b>Mileage on FEDV</b> <ul style="list-style-type: none"> <li>○ Given the factory shutdown due to COVID-19, Tesla requests EPA to approve use of a vehicle that exceeds the stipulated mileage requirement under the CFRs.</li> </ul> </li> <li>• EPA has no concerns over the FEDV mileage exceedance but will require Tesla to adhere to previously agreed policies over selection of vehicles for testing for all future testing.</li> <li>○ Tesla will provide EPA with details on hardware that remains within the stipulated mileage requirement and what hardware was replaced. In the future , Tesla agreed to limit this deviation for this instance.</li> </ul>	<ul style="list-style-type: none"> <li>○</li> </ul>

Suraj Nagaraj | Director, Homologation

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p. +1 (510) 249-8749 | m. +1 (510) 301-4607 | [snagaraj@tesla.com](mailto:snagaraj@tesla.com)

**T E S L A**

**To:** Wright, DavidA[Wright.DavidA@epa.gov]  
**From:** Kyle Strohmaier[kstrohmaier@tesla.com]  
**Sent:** Tue 6/26/2018 6:26:15 PM (UTC)  
**Subject:** RE: EPA review of Model 3 AWD/Performance  
ATT00001.txt

Understood. Thanks for the clarification. I'll see you soon.

Thanks,

Kyle

---

**From:** Wright, DavidA [mailto:Wright.DavidA@epa.gov]  
**Sent:** Tuesday, June 26, 2018 2:24 PM  
**To:** Kyle Strohmaier <kstrohmaier@tesla.com>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Nope that's still our laboratory building (which you will want to stay away from) the office building is just west of the laboratory building and the office building parking lot is off Traverwood and not Plymouth Rd. The office building's address is 2000 Traverwood.

Let me know if you have any other questions or need any additional information.

Regards,

David

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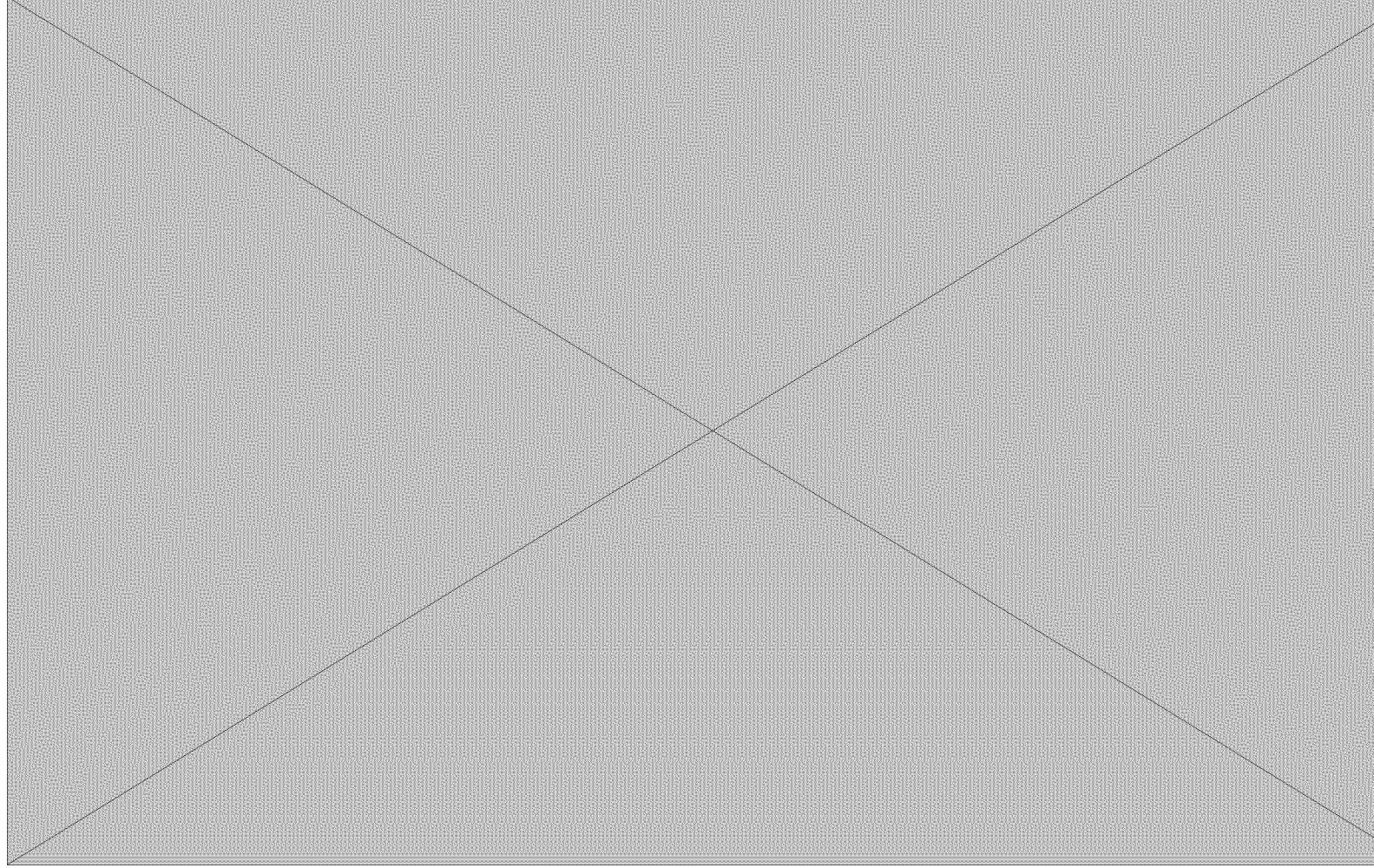
**From:** Kyle Strohmaier [mailto:kstrohmaier@tesla.com]  
**Sent:** Tuesday, June 26, 2018 1:52 PM  
**To:** Wright, DavidA <Wright.DavidA@epa.gov>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Hi David,

Is the entrance I've circled below the correct one?

Thanks,

Kyle



---

**From:** Wright, DavidA [<mailto:Wright.DavidA@epa.gov>]  
**Sent:** Tuesday, June 26, 2018 12:43 PM  
**To:** Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Kyle,

You will want to come to the office building entrance for our meeting this afternoon.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Kyle Strohmaier [<mailto:kstrohmaier@tesla.com>]  
**Sent:** Monday, June 25, 2018 8:15 PM  
**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>  
**Cc:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Hi David,

Thanks for setting up this meeting. Would you mind sending an invite to Vineet as well? He won't be able to attend in person but would like to call in.

Looking forward to talking tomorrow.

Regards,

Kyle

---

**From:** Wright, DavidA [<mailto:Wright.DavidA@epa.gov>]

**Sent:** Monday, June 25, 2018 2:44 PM

**To:** Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Subject:** RE: EPA review of Model 3 AWD/Performance

Kyle,

You should have received a meeting invitation for tomorrow afternoon at 3 pm eastern time.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Kyle Strohmaier [<mailto:kstrohmaier@tesla.com>]

**Sent:** Monday, June 25, 2018 1:59 PM

**To:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Subject:** RE: EPA review of Model 3 AWD/Performance

Hi David,

I could stop by early tomorrow afternoon. Does that time work for you? If a different time works better, let me know, and I can likely accommodate.

Thank you,

Kyle

---

**From:** Wright, DavidA [<mailto:Wright.DavidA@epa.gov>]

**Sent:** Monday, June 25, 2018 12:43 PM

**To:** Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>; Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>

**Cc:** Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Subject:** RE: EPA review of Model 3 AWD/Performance

Vineet,

Let us know when you would like to have Kyle stop by – the point I wanted to make is that the range values are not the same and that the data for the 5-cycle derating factor are not applicable to the Model 3.

Regards,  
David

---

**From:** Vineet Mehta [<mailto:vineet@tesla.com>]  
**Sent:** Thursday, June 21, 2018 8:24 PM  
**To:** Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>; Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Subject:** Re: EPA review of Model 3 AWD/Performance

Hi David,  
Upon further thought, we would rather address your concerns in person. Kyle Strohmaier happens to be in the area over the next few days. Based on a time that is mutually convenient, he can visit you in person to discuss.  
Also, one correction to your statement below, the true difference in range between E3 RWD and E3 AWD is NOT 35 miles, but close to 20 miles based on the data we have submitted.  
Thanks  
Vineet

---

**From:** Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>  
**Date:** Thursday, June 21, 2018 at 12:51 PM  
**To:** DavidA Wright <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>, "Rojeck, Tristin" <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** William Ott <[ott.william@epa.gov](mailto:ott.william@epa.gov)>, Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>, David Good <[good.david@epa.gov](mailto:good.david@epa.gov)>, Vineet Mehta <[vineet@tesla.com](mailto:vineet@tesla.com)>, Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

David – We feel if we could discuss this over a phone call for better understanding and let us know if you have time (30 mins) today or tomorrow. Thanks

Kannan

---

**From:** Wright, DavidA [<mailto:Wright.DavidA@epa.gov>]  
**Sent:** Thursday, June 21, 2018 10:59 AM  
**To:** Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>; Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>; Good, David <[good.david@epa.gov](mailto:good.david@epa.gov)>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Kannan,

At this time it is our thought that the label range value for the LR AWD Model 3 needs to be voluntarily lowered in the same manner as was performed for the LR RWD Model 3. As noted in the EPA regulations “Manufacturers may voluntarily lower fuel economy values and raise CO2 values if they determine that the label values are not representative.” As these values are provided on the label to inform consumers of the relative performance of the different vehicles, and, as the test data generated by Tesla show the range of the AWD is around 35 miles less than the RWD model it is appropriate for these differences to be reflected in the label range value. To label the vehicles with the same range value when the MPGe is not the same and the battery capacity is the same (which will be publicly available information at the time of introduction to commerce) does not make sense, nor is it consistent with the test data Tesla has submitted.

The same issue exists with Tesla deciding to use a 5-cycle derating factor from you other products for the LR AWD Model 3, while choosing to use the 0.7 derating factor specified in EPA regulations for the LR RWD Model 3. EPA does not think that this derating factor is applicable to the Model 3 as the electrical motors and inverters are not the same as those used to generate the derating factor. It is our belief that Tesla needs to generate a derating factor for the Model 3 AWD system if Tesla decides to use a 5-cycle method for generating the derating factor, otherwise the 0.7 factor needs to be applied.

Let me know if you have any questions regarding the information provided in this note.

Regards,

David

David Wright  
Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4467

---

**From:** Kannan Govindasamy [<mailto:kgovindasamy@tesla.com>]  
**Sent:** Wednesday, June 20, 2018 6:11 PM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Hello Tristin,

For LR RWD, we did use the default derating factor (0.7), due to time constraints we did not go through 5-cycle testing and only used MCT.

For LR AWD, we did use the custom derating factor (0.7032) as agreed with EPA before for S & X. This is basically derived from Ratio of five cycle /two cycle combined FE value (mi / kwh-dc) as shown in the attachment. We are not voluntarily reducing the range and reported as is for AWD.

I can correct the Test lab information in next round. I will go ahead submit the rest of the VERIFY information for issuing the certificate. Thanks

**Kannan Govindasamy | Vehicle Homologation |** desk 510.249.3755 | Tesla Inc. 901 Page Ave, Fremont CA 94538

Derating factor = Five cycle combined FE (3.91) / Two cycle combined FE (5.555) = 0.7032

---

**From:** Rojeck, Tristin [<mailto:rojeck.tristin@epa.gov>]  
**Sent:** Wednesday, June 20, 2018 2:11 PM  
**To:** Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>  
**Cc:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Hello Kannan,

Thank you for the response and additional information. The explanation of the MCT Range difference makes much more sense now.

Where is the “Derating Factor” of 0.7032 derived from? In the initial submission of the LR RWD version, the generally applicable 0.7 was used as the derating factor per 40CFR 600.210-12. Also, we’re internally wondering if Tesla is considering voluntarily lowering the label range consistent with the prior LR RWD version especially because they have different MPGe label values.

Additionally, a minor error in the certification application was found for test group JTSLV00.0L23. The Lab for the test data in the MCT calculator (page 18) is stated as “NVFEL” rather than Tesla’s Lab. Please update this when you get a chance to avoid confusion later.

Regards,

ED\_006488\_00003491-00005

Tristin Rojeck

Light-Duty Vehicle Center – Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency  
(734) 214-4649

**From:** Kannan Govindasamy [<mailto:kgovindasamy@tesla.com>]  
**Sent:** Tuesday, June 19, 2018 5:16 PM  
**To:** Rojeck, Tristin <[rojeck.tristin@epa.gov](mailto:rojeck.tristin@epa.gov)>  
**Cc:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>; Kyle Strohmaier <[kstrohmaier@tesla.com](mailto:kstrohmaier@tesla.com)>  
**Subject:** RE: EPA review of Model 3 AWD/Performance

Hello Tristin,

The AWD MCT range is larger simply due to a different cruising speed having been used for the CSC sections, which make up the majority of the distance travelled during the MCT test.

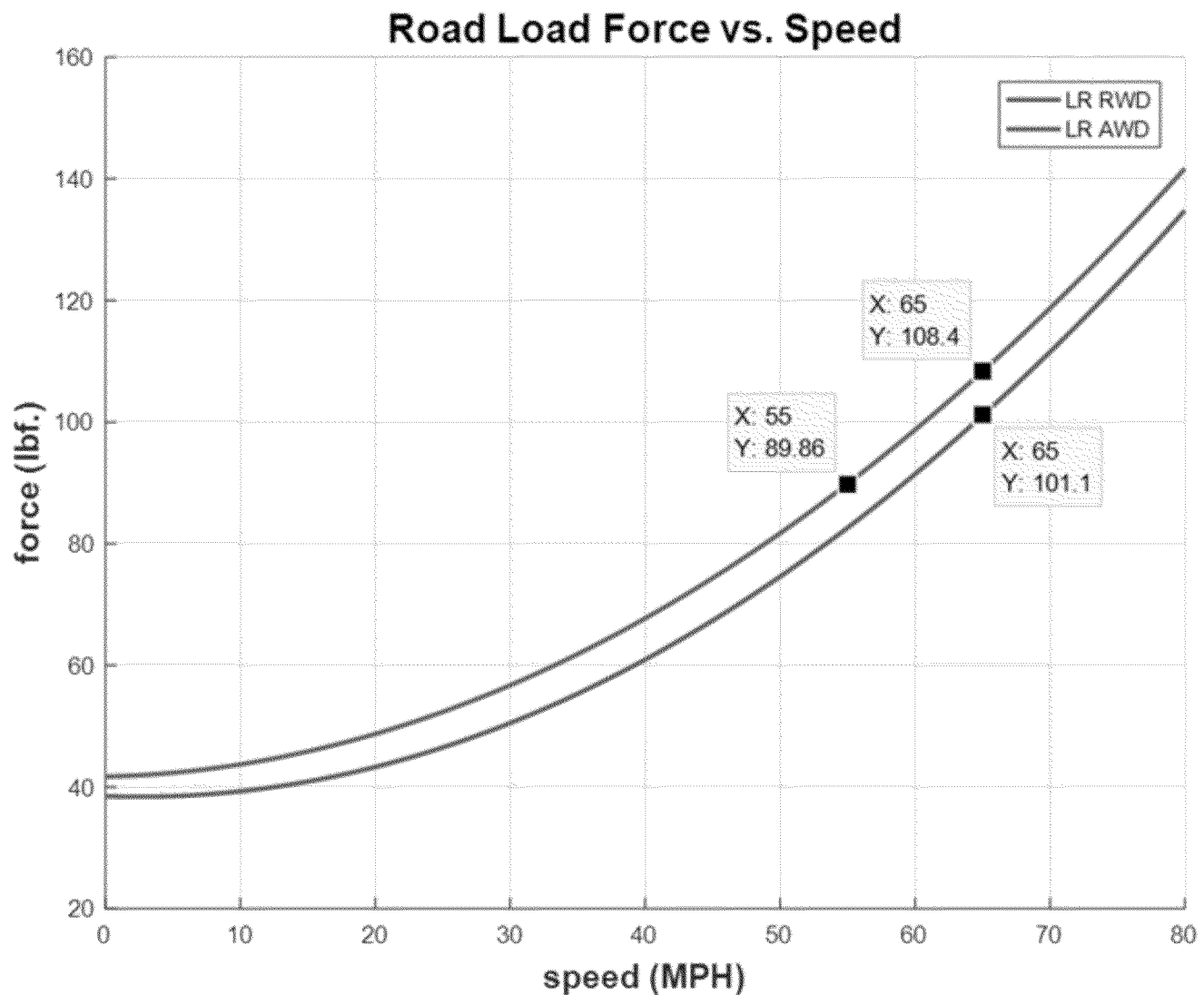
We used 65 MPH for CSC during the RWD test, due to testing time constraints, and EPA ran the confirmatory test using 65 MPH. In preparation for the AWD testing, we reviewed the test sequence and found that 55 MPH is allowed per current SAE standard (J1634 2012) version, per CFR Section (600.116-12 and 600.001 “Incorporation by reference”).

The road load curves we have submitted show that there could be no physical explanation for the AWD car being more efficient than RWD at a given cruising speed. This is consistent with the results submitted for the HWY and UDDS cycles. Torque split optimization cannot close the gap in road load, because the PM machine is shared by both variants and is more efficient than the front IM in the AWD variant. See Road Load Force comparison below at different CSC speed.

Please let us know if you have questions and let me know if I can submit the rest of the VERIFY sections to request the certificate.  
Thanks

**Kannan Govindasamy** | Vehicle Homologation | desk 510.249.3755 | Tesla Inc. 901 Page Ave, Fremont CA 94538

RWD RLF @ 65 MPH	AWD RLF @ 65 MPH	AWD RLF @ 55 MPH
+0% [baseline]	+7.2%	-11.1%



**From:** Rojeck, Tristin [<mailto:rojeck.tristin@epa.gov>]

**Sent:** Tuesday, June 19, 2018 10:46 AM

**To:** Kannan Govindasamy <[kgovindasamy@tesla.com](mailto:kgovindasamy@tesla.com)>; Suraj Nagaraj <[snagaraj@tesla.com](mailto:snagaraj@tesla.com)>

**Cc:** Wright, DavidA <[Wright.DavidA@epa.gov](mailto:Wright.DavidA@epa.gov)>; Ott, William <[ott.william@epa.gov](mailto:ott.william@epa.gov)>

**Subject:** EPA review of Model 3 AWD/Performance

Hello Kannan and Suraj,

After reviewing Tesla's confirmatory test and decision information and the application for test group JTSLV00.0L23, a few questions arose based on the comparison of this LR AWD version of the Model 3 compared to the initial LR RWD option. Attached is a spreadsheet that uses calculations from SAE J1634 for MCT data analysis to compare the results of the two Model 3 variations per the values given in the certification applications. It came to our attention that the MCT range for the LR RWD option was 371.47 miles and the MCT range for the LR AWD option was 420.4 miles, while the charge depleting tests showed a decreased range and decreased MPGe values for both the HWY and UDDS cycles for the LR AWD option.

It is understood that some optimization will occur based on the dual motor operation at higher speeds, but there is a drastic difference between the RWD and AWD variations that may not be clearly represented on the charge depleting HWY test. Values highlighted in yellow on the appended spreadsheet are of particular interest. An explanation for the differences would be appreciated and would aid the review process.

Best Regards,

Tristin Rojeck

Light-Duty Vehicle Center – Compliance Division

ED\_006488\_00003491-00007



